10-5411-202-14

TM 10-5411-202-14

TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE FOR

SHELTER, TACTICAL, NONEXPANDABLE

(NSN 5411-01-136-9837)

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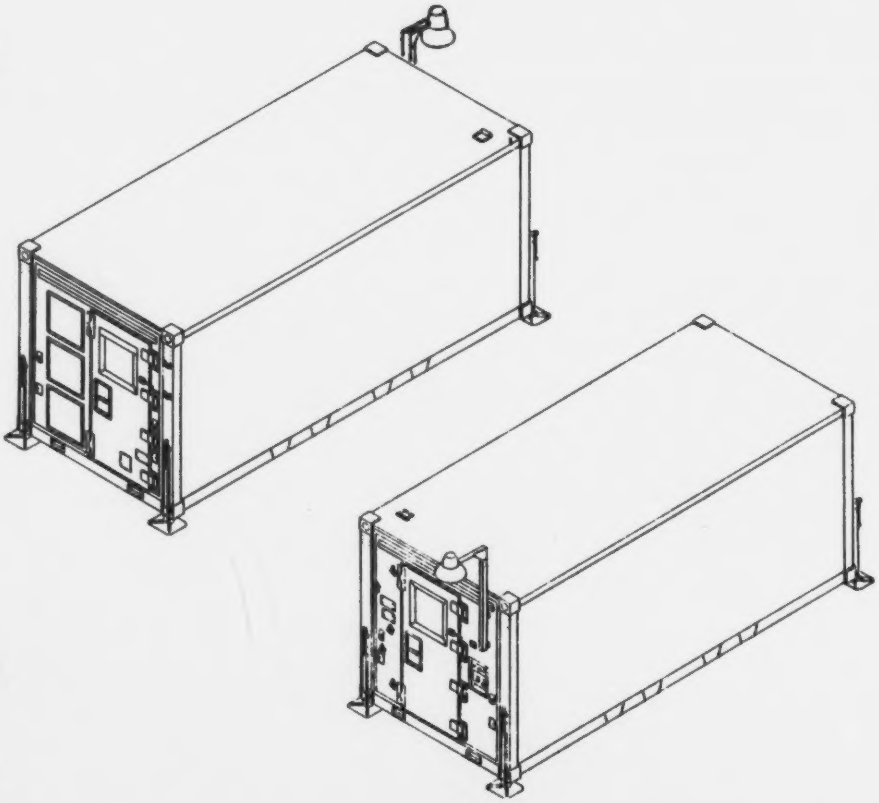

HEADQUARTERS, DEPARTMENT OF THE ARMY

9 APRIL 1987

D 101.11:

WARNING

HIGH VOLTAGE

exists in the electrical system of this equipment

DEATH ON CONTACT

may result if personnel fail to observe safety precautions

DEATH ON CONTACT
may result if shelter is used without grounding it first.

Before performing continuity checks or replacing electrical components, make sure that electrical power is completely disconnected from the circuit involved.

In the event of fluorescent lamp breakage, care must be taken in the removal of broken glass fragments and white phosphorous dust. Inhalation of phosphorous dust could cause serious injury.

Do not use handling equipment with capacity of less than gross weight of shelter system. Do not allow shelter to swing back and forth when it is suspended. Failure to observe this warning may result in damage to equipment or severe injury or death to personnel.

Methylethylketone (MEK) is flammable and toxic and must be used only in a well-ventilated area away from all sparks or open flame. Gloves should be worn during use.

In extreme cold, do not touch metal parts with bare hands. Severe skin damage may result.

Safety glasses must be worn by personnel when installing ground anchors.

Disconnect all power sources from power entry panel assembly before testing.

Disconnect all power sources from power entry panel assembly before removing.

The light assembly contains voltage that is dangerous if contacted.

TECHNICAL MANUAL

TM 10-5411-202-14

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 9 April 1987

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE

SHELTER, TACTICAL, NONEXPANDABLE
(NSN 5411-01-136-9837)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U. S. Army Troop Support Command, ATTN: AMSTR-MPS, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished directly to you.

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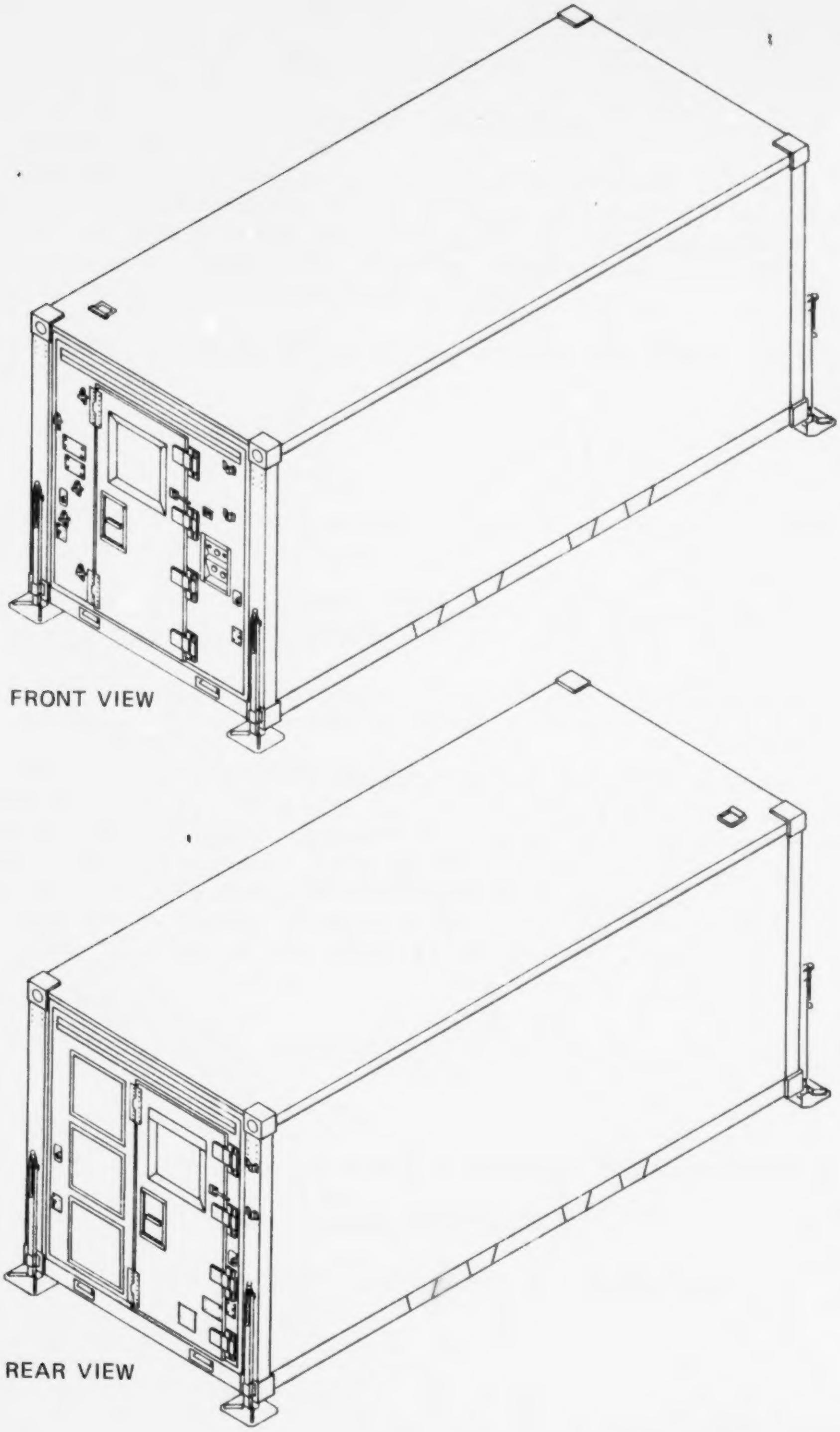


FRONT VIEW

REAR VIEW

Full External View of Nonexpandable Tactical Shelter

CHAPTER 1

INTRODUCTION

Section I GENERAL INFORMATION

1-1. SCOPE. This manual is for use by personnel responsible for operation and maintenance of the nonexpandable tactical shelter, which will be referred to as the shelter. It provides the user with necessary instructions to use the shelter and to perform required maintenance in accordance with the Maintenance Allocation Chart in Appendix B.

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS. Maintenance forms, records, and reports used by:

a. Are prescribed by DA PAM 738-750, the Army Maintenance Management System (TAMMS).

b. Users shall refer to the Maintenance Allocation Chart (MAC) for task and levels of maintenance to be performed.

1-3. DESTRUCTION OF MATERIEL TO PREVENT ENEMY USE. For destruction procedures for materiel refer to TM 750-244-3.

1-4. ADMINISTRATIVE STORAGE. For procedures and inspections required during administrative storage, refer to Chapter 4, paragraph 4-41.

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR'S). If your shelter needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to: Commander, U.S. Army Troop Support Command ATTN: AMSTR-QX, 4300 Goodfellow Boulevard, St. Louis, Missouri 63120-1798. We'll send you a reply.

1-6. LIST OF ABBREVIATIONS.

AC	Air Conditioner
cm	centimeter
CSC	(International) Convention for Safe Containers
ECU	Environmental Control Unit
EIR	Equipment Improvement Recommendation
ft	foot (feet)
Hz	Hertz
in	inch
ISO	International Organization for Standardization

kg	Kilogram
lb	pound
lg	long
MAC	Maintenance Allocation Chart
MEK	Methylethylketone (Solvent)
mm	millimeter
MTOE	Modified Table of Organization and Equipment
No.	number
PMCS	Preventive Maintenance Checks and Services
ref	reference
sq	square
TMDE	Test, Measurement and Diagnostic Equipment
Vac	Volts, alternating current

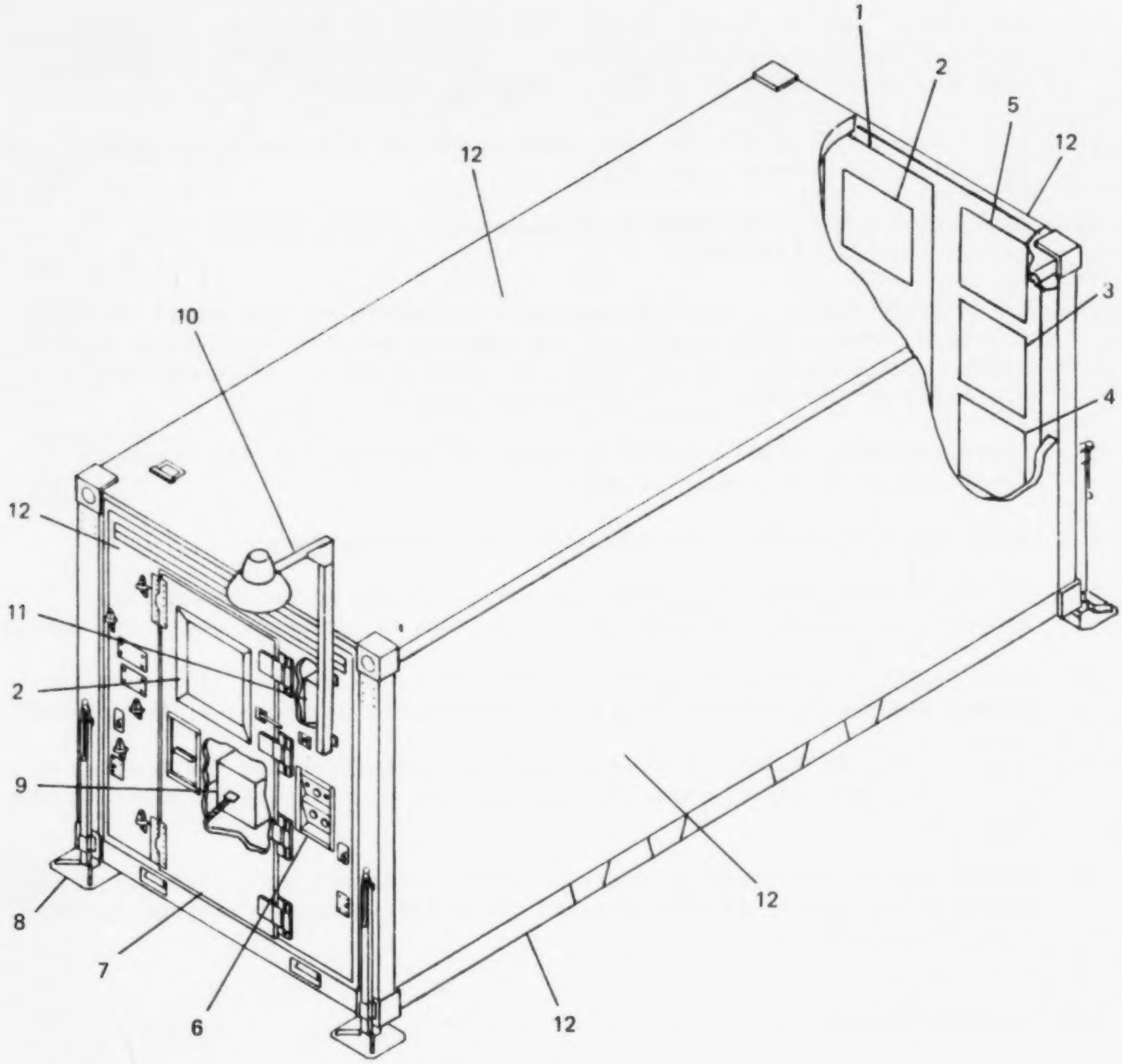
Section II. EQUIPMENT DESCRIPTION AND DATA

1-7. PURPOSE OF NONEXPANDABLE TACTICAL SHELTER. A self-contained transportable multi-application utility shelter. A member of family of standard rigid wall ISO shelters to be used by the Army.

Capabilities and Features:

- Equipped with standard ISO fittings for easy transportability.
- Provided with mobilizer fittings for mobilizer transportation.
- Built-in fork lift provisions.
- All weather operation.
- Environmentally controlled interior.
- Rigid wall construction.
- Simple and fast deployment.
- Designed to operate under blackout conditions with door activated blackout switch.
- External electrical power connection.
- Easy to maintain.

1-8. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.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2
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1-8. (cont)

1. REAR PERSONNEL DOOR. Provides access to rear of shelter.

2. DOOR VENTS. Manually operated vents provide ventilation for the shelter. These vents must be open when the shelter is transported by an aircraft.

3. FAN PANEL. Can be installed when the shelter is deployed. Controls interior temperature of the shelter. Operates on high or low speeds, also can be switched to intake or exhaust positions.

4. ECU RETURN PANEL. Returns recirculated air to externally installed environmental control unit (ECU).

5. ECU INTAKE PANEL. Delivers environmentally controlled air from externally installed ECU.

6. POWER ENTRY PANEL. A service entrance connector on this panel receives external primary input power for the shelter and routes it to a circuit breaker panel inside the shelter. Includes provisions for optional shelter grounding and telephone connections.

7. FRONT PERSONNEL DOOR. Provides access to shelter. During blackout conditions only this door is used.

8. CONTAINER LIFT JACKS. Provide means for leveling shelter.

9. EQUIPMENT CONTAINER. Contains fan cover, ground anchor assemblies, 150-watt floodlight, screwdriver, drive rod, drive head, and drive handle.

10. AREA LIGHT. Attaches to either endwall panel to provide illumination around the shelter area. Plugs into receptacle on the power entry panel.

11. CIRCUIT BREAKER PANEL. Provides overload protection for the shelter circuits. Main circuit breaker switches off all electrical power to the shelter.

12. FIXED PANELS. Consists of front and rear personnel end, fixed floor, fixed walls, and fixed roof panels. Used for equipment storage during transportation.

1-9. EQUIPMENT DATA.

Exterior Dimensions	
Width	8 ft. (2.44 meters)
Height	8 ft. (2.44 meters)
Length	19 ft., 10-1/2 in. (6.05 meters)
Interior Dimensions	
Minimum clear height	85.33 in. (2.17 meters)
Minimum clear width	90.84 in. (2.31 meters)
Usable floor space	144 sq. ft. (13.38 sq. meters)

1-9 (cont)

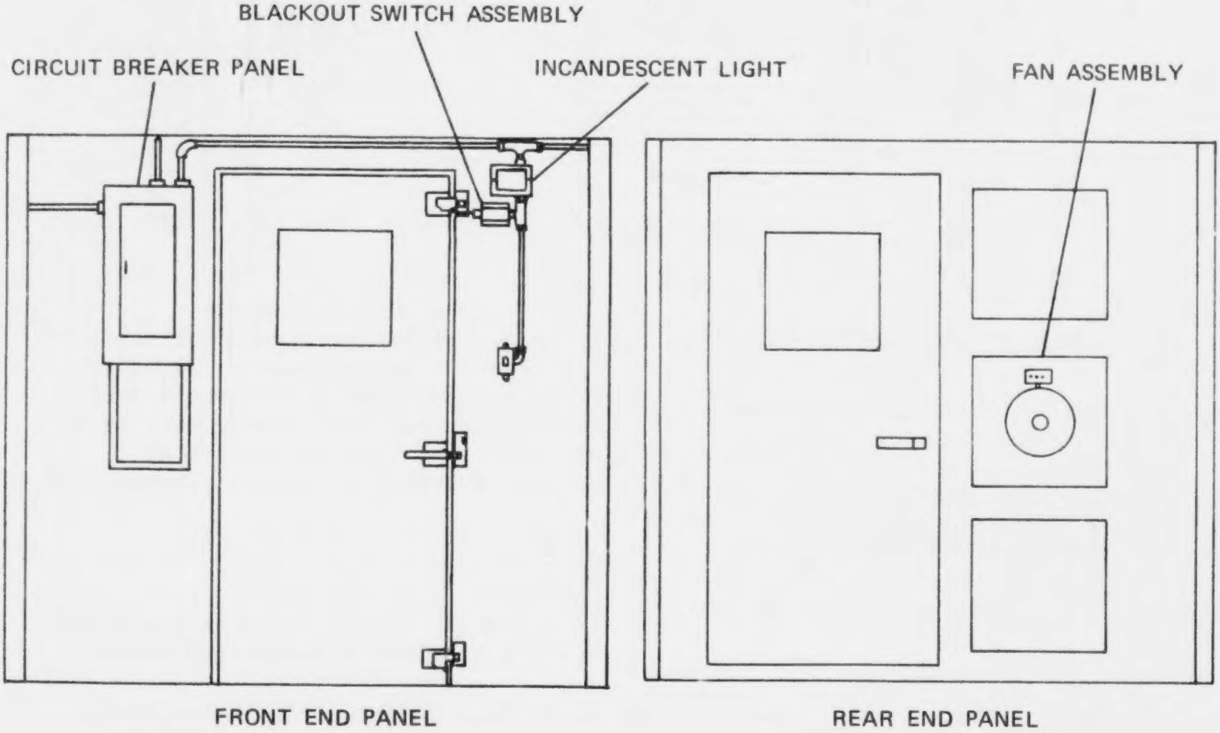
Total Weights	
Less payload	4,600 lbs. (2087 kg)
With payload (maximum)	15,000 lbs. (6804 kg)
Primary Power Requirements	120/208 Vac, 60 Hz, 3 phase, 5 wire
Environmental Limits	
Operating temperature	-65°F to +125°F (-53.9°C to 51.7°C)
Non-operating temperature (storage)	-70°F to +160°F (-56.7°C to +71.0°C)
Transportability	
ISO fittings	Provided with upper and lower ISO fittings in accordance with specification ISO 1496/1.
Dolly Set	Equipped with mobilizer fittings for transportation with mobilizer. Model No. M832 10,000 pounds (4546 Kg) maximum capacity (TM 9-2330-275-14&P). Model No. M1022 15,000 pounds (6804 Kg) maximum capacity (TM 9-2330-379-14&P).
Fork Lift	Built-in fork lift provisions.

CHAPTER 2

OPERATING INSTRUCTIONS

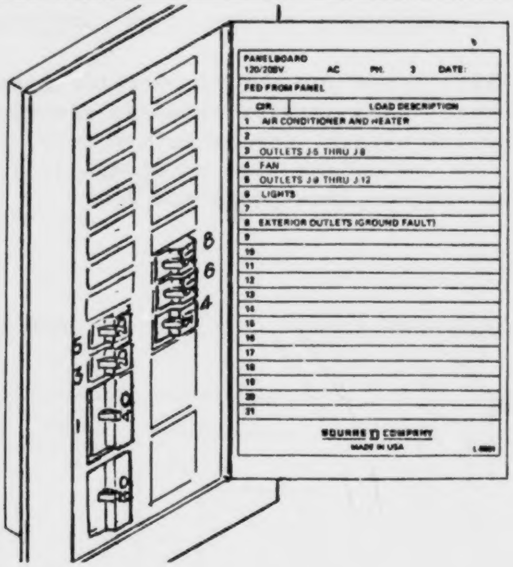
Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2-1. SCOPE. This section provides description and use of operator controls and indicators needed to operate shelter. This section provides descriptions for circuit breaker panel controls and indicators (See paragraph 2-2), front personnel end panel mounted controls and indicators (See paragraph 2-3), and rear end panel mounted controls and indicators (See paragraph 2-4).


BLACKOUT SWITCH ASSEMBLY
CIRCUIT BREAKER PANEL
INCANDESCENT LIGHT
FAN ASSEMBLY
FRONT END PANEL
REAR END PANEL

INSIDE VIEW - LOOKING AT FRONT AND REAR END PANELS

2-2. CIRCUIT BREAKER PANEL CONTROLS AND INDICATORS


PANELBOARD
120/208V AC PH. 3 DATE:
FED FROM PANEL
CIR.
LOAD DESCRIPTION
1 AIR CONDITIONER AND HEATER
2
3 OUTLETS J-5 THRU J-8
4 FAN
5 OUTLETS J-9 THRU J-12
6 LIGHTS
7
8 EXTERIOR OUTLETS (GROUND FAULT)
9
10
11
12
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SQUARE D COMPANY
MADE IN USA
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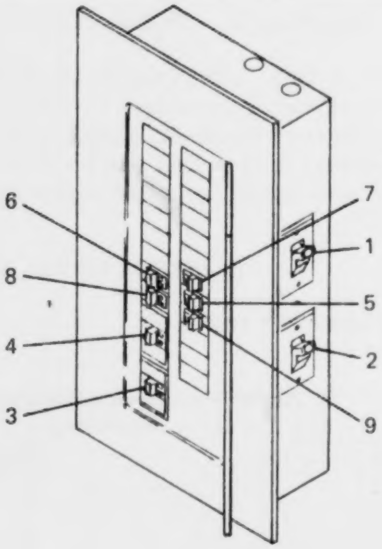


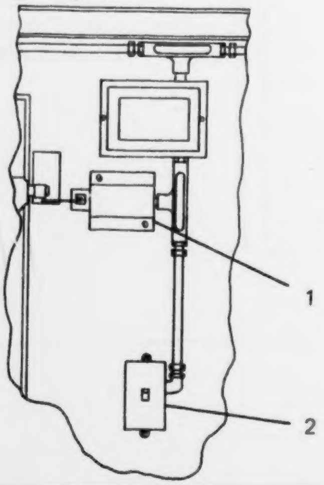
	Control or Indicator	Function
1	Blackout override switch	In ON position, overrides door activated blackout switch mounted on front end panel adjacent to personnel door. During blackout conditions, must be in OFF position. Circuit protected against overload by circuit breaker.
2	Incandescent light switch	In ON position, turns on wall mounted incandescent light. In OFF position, turns off wall mounted incandescent light. Circuit protected against overload by circuit breaker.
3	Main circuit breaker	In ON position, delivers electrical power to individual circuit breakers. In OFF position, turns off all electrical power in shelter.
4	Circuit breaker	Provides overload protection for heater/ac supply receptacle mounted on power entry panel.
5	Circuit breaker	Provides overload protection for incandescent light, blackout circuit mounted on front endwall and all flourescent lights in shelter.

2-2. (cont)

Control or Indicator	Function
6 Circuit breaker	Provides overload protection for interior utility outlets mounted on one sidewall.
7 Circuit breaker	Provides overload protection for ground fault interrupter utility outlet mounted on power entry panel.
8 Circuit breaker	Provides overload protection for interior utility outlets mounted on one sidewall.
9 Circuit breaker	Provides overload protection for fan on rear end panel.

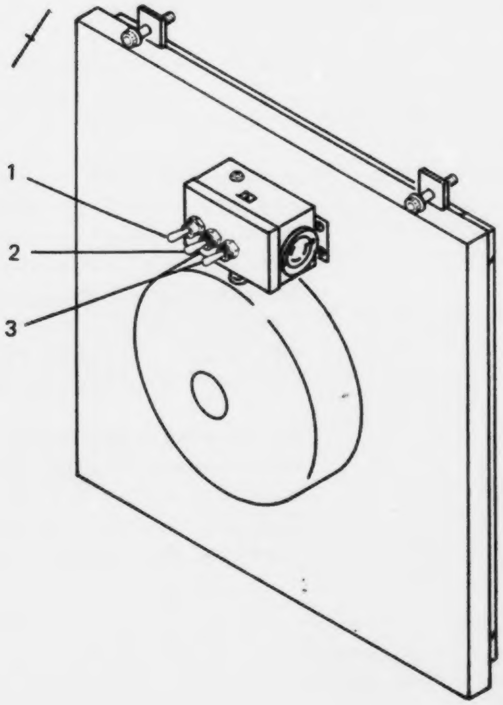
2-3. FRONT END PANEL MOUNTED CONTROLS AND INDICATORS

Control or Indicator	Function
1 Door activated blackout switch	During blackout conditions it turns off all lights in shelter when front personnel door is opened. To override operation of this switch, the circuit breaker panel mounted blackout override switch must be in ON position. Circuit protected against overload by circuit breaker.
2 Ceiling lights switch	In ON position, turns on three fluorescent lights in shelter. In OFF position turns off three fluorescent lights. Circuit protected against overload by circuit breaker.



2-4. REAR END PANEL MOUNTED CONTROLS AND INDICATORS

Control or Indicator		Function
1	HIGH/LOW switch	Selects fan speed. In up (HIGH) position, fan runs at high speed. In down (LOW) position, fan runs at low speed.
2	INTAKE/EXHAUST switch	Selects fan rotation. For exhaust, switch must be in up (EXHAUST) position. For intake, switch must be in down (INTAKE) position.
3	ON/OFF switch	In up (ON) position, turns on the fan. In down (OFF) position, turns off the fan. Circuit protected against overload by circuit breaker.



Section II OPERATOR'S PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-5. GENERAL. For the shelter to be ready for use at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure.

a. Before you operate. Always keep in mind the CAUTIONS and WARNINGS. Perform your "B-before" PMCS.

b. While you operate. Always keep in mind the CAUTIONS and WARNINGS. Perform your "D-during" PMCS.

c. Monthly. Always keep in mind the CAUTIONS and WARNINGS. Perform your "M-monthly" PMCS.

d. If your equipment fails to operate, troubleshoot with proper equipment. Report deficiencies as follows: Users report in accordance with DA PAM 738-750.

2-6. SPECIAL INSTRUCTIONS. The following actions apply while performing your PMCS:

a. Stop operation immediately if deficiency is noted during operation which would damage the equipment.

b. Defects discovered during operation of the equipment should be noted for future correction to be made as soon as operation has ceased.

2-7. PREVENTIVE MAINTENANCE CHECKS AND SERVICES TABLE. The following is a list of all PMCS to be performed by the operator.

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down. Inspect shelter for leaks.

Operator's Preventive Maintenance Checks and Services

B - Before D - During M - Monthly

Item No.	Interval B	Interval D	Interval M	Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	For Readiness reporting, equipment is Not Ready/ Available if:
ELECTRICAL SYSTEM						
1	●	●	●	Circuit breaker panel assembly	Inspect for damage to door and panel	Circuit panel damaged
2	●	●	●	Panel wiring	Inspect for damage or disconnection	Wiring damaged or disconnected
3	●	●	●	Light switches	Inspect for operation	Lights not operating
4	●	●	●	Circuit breakers	Inspect for operation, condition, and security	Circuit breakers not operating
5	●	●	●	Power entry panel assembly	Inspect for damage to panel	Panel damaged
6	●	●	●	Receptacles	Inspect for operation, condition, and security	Receptacles not operating
7	●	●	●	Terminals/ Connectors	Inspect for operation, condition, and security	Terminals/connectors not operating
8	●	●	●	Area light assembly	Inspect for operation	Light not operating
9	●	●	●	Incandescent light assembly	Inspect for operation	Light not operating
10	●	●	●	Ceiling lights	Inspect for operation	Lights not operating
11	●	●	●	Receptacle outlets	Inspect for operation	Outlets not operating
12	●	●	●	Fan assembly	Inspect for operation	Switches not operating
13	●	●	●	Blackout switch	Inspect for operation	Switch not operating

Operator's Preventive Maintenance Checks and Services (cont)

B - Before D - During M - Monthly

Item No.	Interval			Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	For Readiness reporting, equipment is Not Ready/ Available if:
	B	D	M			
DOOR ASSEMBLIES						
14	●		●	Personnel doors	Inspect for operation, condition and security	Door not operating, damaged, or insecure
15	●		●	Door vents	Inspect for operation and condition	Vent not operating or damaged
16	●		●	Door lock assemblies	Inspect for operation and condition	Lock assembly not operating or damaged
17	●		●	Door stop assemblies	Inspect for operation and condition	Stop assembly not operating or damaged
CONTAINER LIFT JACK ASSEMBLIES						
18	●	●	●	Container lift jack assemblies	a. Inspect for sinking into ground if shelter not level (check frequently during rainy conditions). b. Inspect for condition and security	a. Shelter not level b. Jacks damaged or insecure
FIXED PANEL ASSEMBLIES						
19	●		●	Front endwall panel	a. Inspect skin surface for paint damage, corrosion, cracks, or punctures b. Inspect security of upper mobilizer fitting	a. Panel skin corroded, cracked, or punctured b. Upper mobilizer fitting insecure
20	●		●	Level assemblies	Inspect for condition and security	Level assembly damaged or insecure

Operator's Preventive Maintenance Checks and Services (cont)

B - Before D - During M - Monthly

Item No.	Interval B	Interval D	Interval M	Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	For Readiness reporting, equipment is Not Ready/ Available if:
21	●		●	Folding steps	Inspect for condition and security	Folding step damaged or insecure
22	●		●	Fan assembly panel	Inspect skin surface for paint damage, corrosion cracks, or punctures	Panel skin corroded, cracked, or punctured
23	●		●	ECU intake panel	Inspect skin surface for paint damage, corrosion, cracks, or punctures	Panel skin corroded, cracked, or punctured
24	●		●	ECU return panel	Inspect skin surface for paint damage, corrosion, cracks, or punctures	Panel skin corroded, cracked, or punctured
25	●		●	Closeout Panels	Inspect skin surface for paint damage, corrosion, cracks, or punctures	Panel skin corroded, cracked, or punctured
26	●		●	Rear endwall panel	a. Inspect skin surface for paint damage, corrosion, cracks, or punctures b. Inspect security of upper mobilizer fittings	a. Panel skin corroded, cracked, or punctured b. Upper mobilizer fittings insecure
27	●		●	Sidewall panels	Inspect skin surface for paint damage, corrosion, cracks, or punctures	Panel skin corroded, cracked, or punctured
28	●		●	Roof panel	a. Inspect skin surface for paint damage, corrosion, cracks, or punctures b. Inspect roof hand hold for condition and security	a. Panel skin corroded, cracked, or punctured b. Hand hold damaged or insecure

Operator's Preventive Maintenance Checks and Services (cont).

B - Before D - During M - Monthly

Item No.	Interval B	Interval D	Interval M	Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	For Readiness reporting, equipment is Not Ready/ Available if:
29	●		●	Stowage brackets	Inspect for condition and security	Stowage brackets damaged or insecure
30	●		●	Floor panel	Inspect skin surface for paint damage, corrosion, cracks, or punctures	Panel skin corroded, cracked, or punctured
FRAME ASSEMBLY						
31	●		●	Corner post and ISO fitting assembly	Inspect for condition and security	Corner post or ISO fitting damaged or insecure
MISCELLANEOUS COMPONENTS						
32	●		●	Equipment container	Inspect for condition and completeness	Equipment container damaged or incomplete
33	●		●	Storm configuration components	Inspect for condition and completeness	Storm configuration components damaged or incomplete

CAUTION

Skin surfaces that are punctured/damaged will allow water entry into honeycomb panel. All punctures/holes of damaged areas must be covered immediately pending permanent repair.

Section III. SETUP OF SHELTER

2-8. PREPARATION FOR USE.

Select a site that:

- Has reasonable maneuvering area for vehicles that will be used for hauling or hoisting shelter.
- The terrain is firm, well drained, and relatively free of surface rocks or stones.
- The slope of the terrain does not exceed 18 inches (45.7 cm) over the projected floor area of the shelter.

2-9. SHELTER INVENTORY CHECKS.

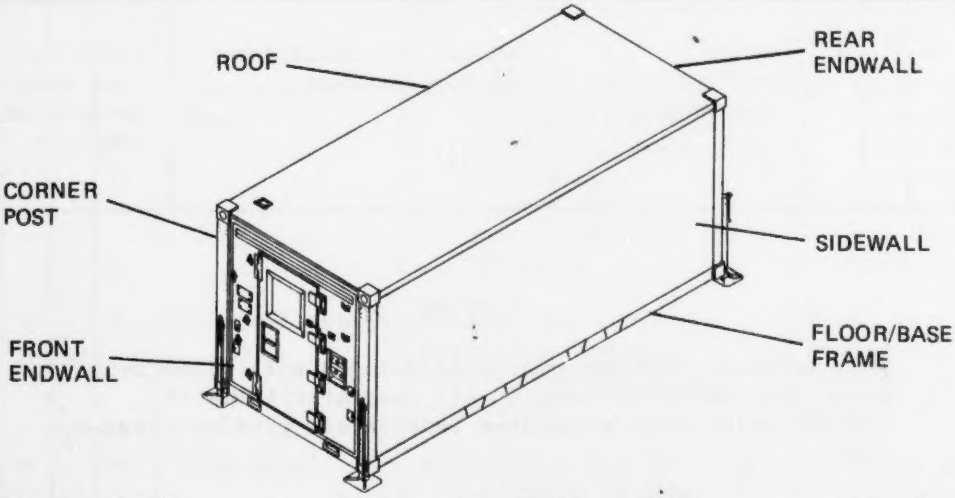
a. Shelters are shipped uncrated.

b. Inspect shelter for damage incurred during shipment. If shelter has been damaged, report damage on DD Form 6, Packaging Improvement Report.

c. Check equipment against packing list to see if shipment is complete. Report all discrepancies in accordance with instructions of DA PAM 738-750.

d. Inspect shelter in accordance with paragraph 2-10.

2-10. SHELTER INSPECTION CHECKLIST



LOCATION	ITEM	ACTION
1. Front endwall	a. Power entry panel	Inspect connectors for damage.
	b. Identification and instruction plates	Check for legibility or missing plates.

2-10. (cont)

LOCATION	ITEM	ACTION
	c. Personnel door	Check for security and condition of door, lock, seals, and vent.
	d. Upper mobilizer fittings	Check for security and condition.
	e. Folding steps	Check for security and condition
	f. Components	Inspect for missing, bent, or damaged components.
	g. Skin	Inspect skin surface for paint damage, corrosion, cracks, or punctures.
2. Roof	a. Roof handhold	Check for security and operation.
	b. Upper ISO fittings	Inspect fittings for damage.
	c. Skin	Inspect skin surface for paint damage, corrosion, cracks, or punctures.
3. Rear endwall	a. CSC Plate	Check for legibility or missing plate.
	b. Personnel door	Check for security and condition of door, lock, seals, and vent.
	c. Upper mobilizer fittings	Check for security and condition.
	d. Components	Inspect for missing, bent, or damaged components.
	e. Skin	Inspect skin surface for paint damage, corrosion, cracks, or punctures.

2-10. (cont)

	LOCATION	ITEM	ACTION
4.	Floor/base frame	a. Lower mobilizer fittings	Check for security and condition
		b. Lower ISO fittings	Inspect fittings for damage.
		c. Frame edge and fork lift openings	Inspect for damage.
5.	Floor panel	Skin	Inspect skin surface for paint damage, corrosion, cracks, or punctures.
6.	Corner posts	Components	Inspect for missing, bent, or damaged components.

2-11. SHELTER HANDLING

WARNING

Do not use handling equipment with capacity of less than gross weight of system. Do not allow shelter to swing back and forth when suspended. Failure to observe this WARNING may result in damage to equipment or severe injury or death to personnel.

NOTE

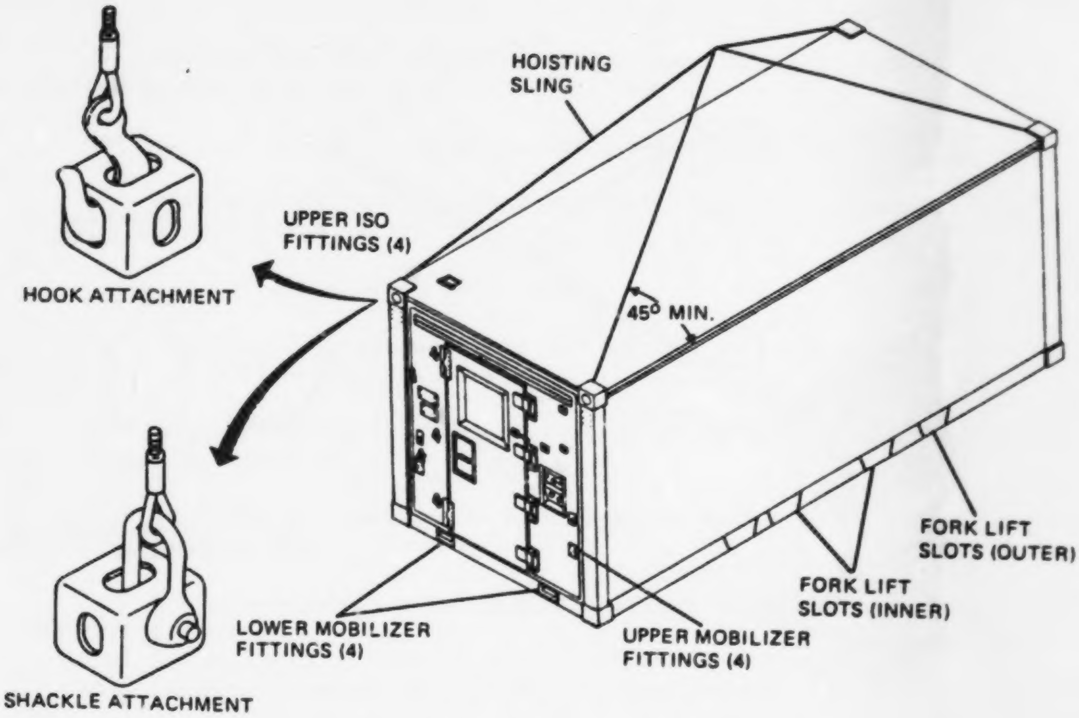
Dollyset M832 mobilizer used only if gross weight of shelter system is 10,000 pounds (4546 Kg) or less.

Dollyset XM1022 or hoisting sling (with cable breaking strength of 35,000 pounds) used if gross weight of shelter system is over 10,000 pounds (4546 kg).

When using fork lift, make sure it has a minimum tine length of six feet. Use inner slots for fork lifting an empty shelter only.

Use 20-foot container lift sling (bottom lift, type II, with a 20 long ton safe working load) with aluminum spreader, Appendix D.

2-11. (cont)


HOISTING SLING
UPPER ISO FITTINGS (4)
HOOK ATTACHMENT
45° MIN.
FORK LIFT SLOTS (OUTER)
FORK LIFT SLOTS (INNER)
LOWER MOBILIZER FITTINGS (4)
UPPER MOBILIZER FITTINGS (4)
SHACKLE ATTACHMENT

a. Hoisting from upper ISO fittings.

CAUTION

Do not attach hoisting sling or ISO lifting device to handling equipment in such a manner that angle between any hoist line and shelter is less than 45 degrees. Any angle less than 45 degrees will cause an excessive strain which could damage shelter.

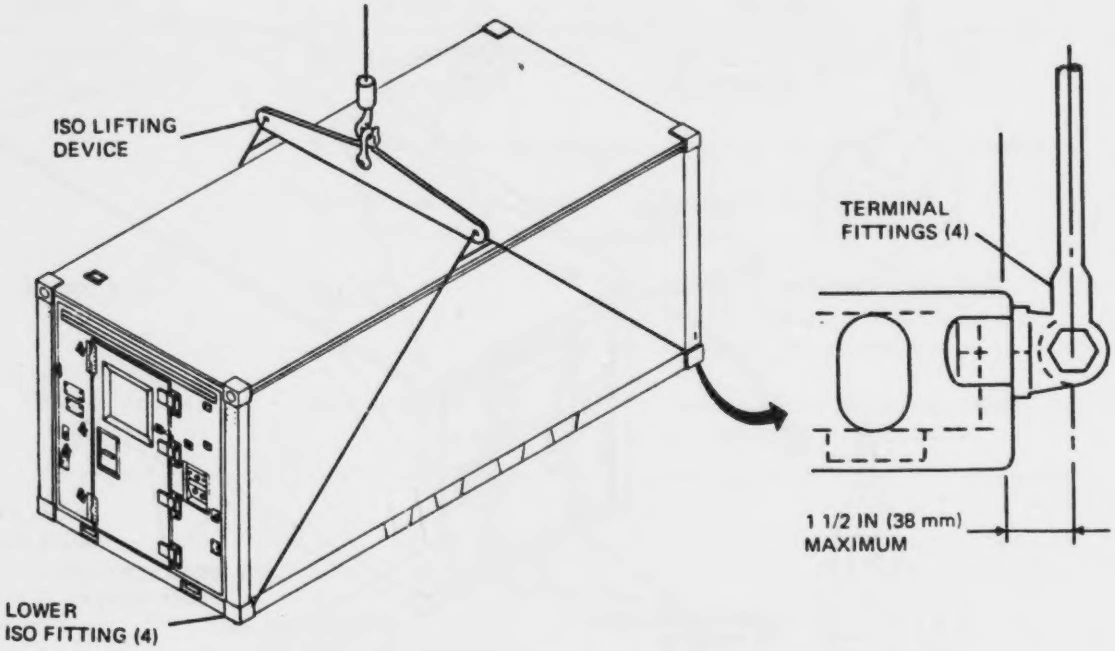
(1) Attach hoisting sling to crane or equivalent and four upper ISO fittings.

(2) Hoist shelter and position to desired location.

b. Hoisting from lower ISO fittings.

(1) Attach ISO lifting device to crane or equivalent and four lower ISO fittings.

2-11. (cont)



(2) The ISO lifting device should contact four lower ISO fittings only and not make any other contact with shelter.

(3) Terminal fittings shall be installed so that lifting forces are exerted not more than 1-1/2 in. (38 mm) away from ISO fittings.

(4) Hoist shelter and position to desired location.

c. Fork lifting from fork lift slots in base frame.

(1) Fork lift arms shall be at least 6 ft (1.8 m) long.

(2) Use care when inserting fork lift arms in fork lift slots.

(3) Use inner slots for fork lifting an empty shelter only.

(4) Use outer slots for fork lifting shelter with maximum payload.

d. Dollyset lifting from mobilizer fittings.

(1) Separate Dollyset sections and prepare for use observing all recommendations to Dollyset technical manual. Refer to TM 9-2330-275-14&P and TM 9-2330-379-14&P.

(2) Position Dollyset sections at ends of shelter adjacent to mobilizer fittings at shelter endwalls.

2-11. (cont)

(3) Position Dollyset brackets to connect with shelter mobilizer fittings and secure Dollyset to shelter.

(4) Operate Dollyset according to Dollyset technical manual to raise shelter to towing height.

(5) Connect towing equipment to Dollyset tow bar.

(6) When shelter is in desired position, operate Dollyset to lower shelter and remove Dollyset sections.

e. Dollyset lifting from ISO fittings.

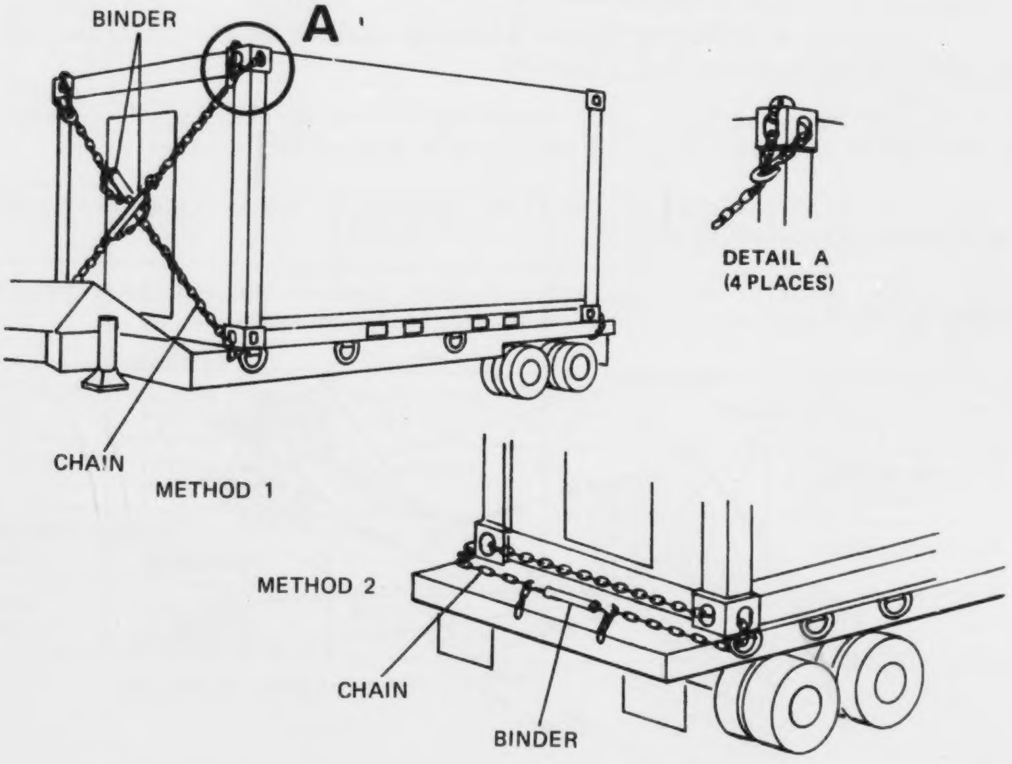
(1) Separate Dollyset sections and prepare for use observing all recommendations of Dollyset technical manual.

(2) Position Dollyset sections at ends of shelter adjacent to ISO fittings at shelter endwalls.

(3) Position Dollyset brackets to connect with shelter ISO fittings and secure Dollyset to shelter.

(4) Operate Dollyset according to Dollyset technical manual to raise shelter to towing height.

(5) Connect towing equipment to Dollyset tow bar.



2-11. (cont)

(6) When shelter is in desired position, operate Dollyset to lower shelter and remove Dollyset sections.

f. Trailer or flatbed transporting.

(1) Using four 14-foot chains and four binders, secure shelter to trailer or flatbed as shown in Method 1. (Refer to page 2-15).

(2) Using two 20-foot chains and two binders or four 6-foot chains and two binders, secure shelter to trailer or flatbed as shown in Method 2. (Refer to page 2-15).

g. Railroad transporting.

(1) Place floor timbers along the front and rear of the shelter contacting lower ISO fittings.

NOTE

Make sure timber is new and has no structural weakness.

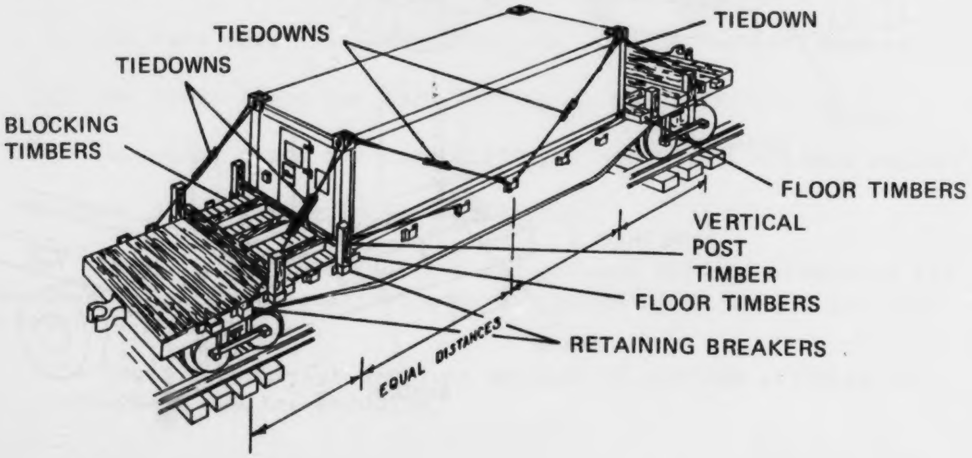
(2) Tie the shelter down to the retaining brackets on the railroad car with 1/2-inch diameter wire rope and turn buckles.

(3) Place 8-inch by 8-inch blocking timbers on the railroad car floor with the edge grain laid flatwise.

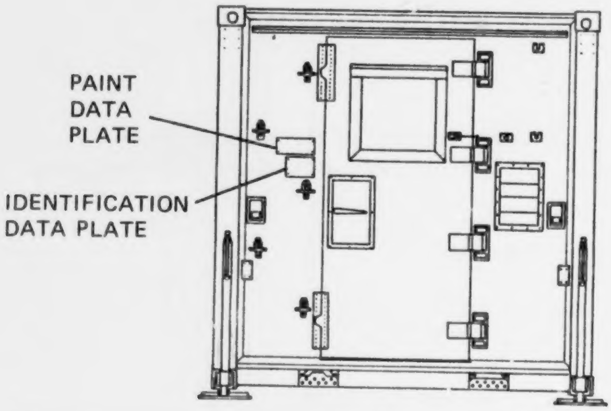
(4) Place at least four 4-inch by 5-inch vertical post timbers with edge grain oriented fore and aft at each end of the shelter.

(5) Bolt the ends of the floor timbers to the vertical post timbers using 3/4-inch diameter bolts.

(6) Spike or nail the vertical post timbers through the retaining brackets on the railroad car to prevent vertical movement.


TIEDOWNS
TIEDOWNS
TIEDOWN
BLOCKING TIMBERS
FLOOR TIMBERS
VERTICAL POST TIMBER
FLOOR TIMBERS
RETAINING BREAKERS
EQUAL DISTANCES

2-12. LOCATION OF IDENTIFICATION AND INSTRUCTION PLATES. The following figures provide location and contents of identification and instruction plates for the shelter.



SER NO ☐

CONTRACT NO: DAAK60-84-C-0016

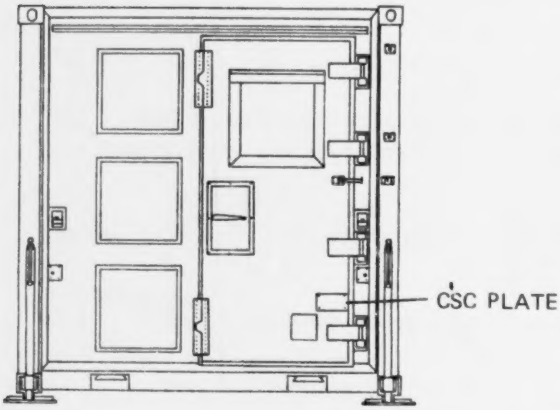
SHELTER, TACTICAL, NONEXPANDABLE

DSGN ACT: 81337 MFR: 05699

PART NO: 5-4-3141-1

NSN 5411-01-136-9837

US



CSC SAFETY APPROVAL

COUNTRY OF APPROVAL USA

DATE MANUFACTURED ☐

IDENTIFICATION NO NSN 5411-01-136-9837

MAXIMUM GROSS WEIGHT 6,804 KG 15,000 LB

ALLOWABLE STACKING WEIGHT FOR 1.8G 90,718 KG 200,000 LB

RACKING TEST LOAD VALUE 15240 KG 33 600 LB

REINSPECTION DUE DATE ☐

APPLY REINSPECTION DECAL HERE

	PAINT TYPE	MIL SPEC COLOR	COLOR CODE FED-STD-595	NSN
INTERIOR PAINT	URETHANE ALIPHATIC ISOCYANATE	MIL-C-83286 GLOSS WHITE	17925	8010-00-181-8282
EXTERIOR PAINT	ALIPHATIC POLYURETHANE	MIL-C-46168 SAND		
PRIMER	EPOXY POLYAMIDE	MIL-P-23377		8010-00-142-9279
FLOOR PRIMER	ZINC CHROMATE	TT-P-1757		8010-00-515-2208
FLOOR PAINT	WALKWAY COMPOUND	MIL-W-5044 TYPE I GRAY	26251	

2-13. LEVELING SHELTER

NOTE

Four personnel are required to perform the following procedures.

a. Remove four container lift jacks from inside of front and rear personnel doors by turning locking handle to loosen jack attachment insert and removing safety pin.

b. Position jacks at each corner of shelter.

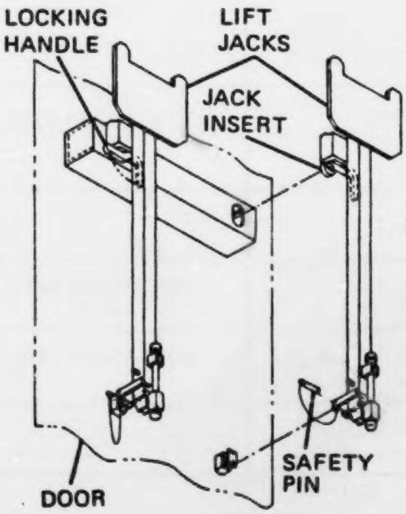
NOTE

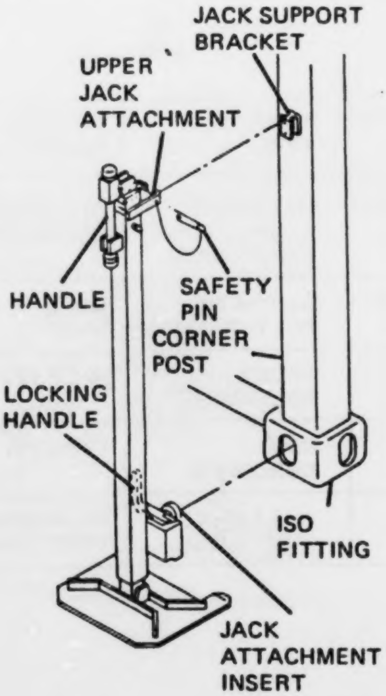
Stencil on jack indicates handle rotation to raise or lower jack.

c. Rotate handle to raise jack until insert will enter lower ISO fitting and upper jack attachment engages jack support bracket on corner post.

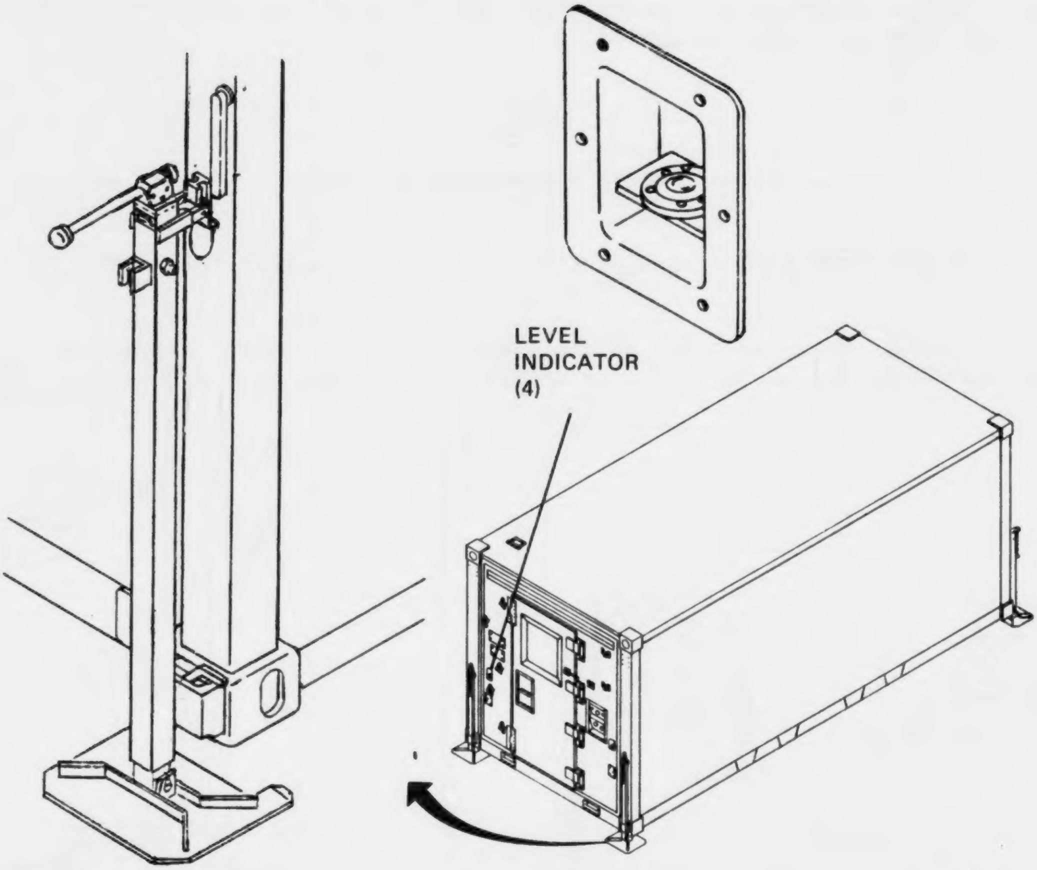
d. Turn locking handle to rotate insert in ISO fitting. Install safety pin.

e. Repeat steps c and d at three remaining corner posts.


LOCKING HANDLE
LIFT JACKS
JACK INSERT
SAFETY PIN
DOOR


JACK SUPPORT BRACKET
UPPER JACK ATTACHMENT
HANDLE
SAFETY PIN
CORNER POST
LOCKING HANDLE
ISO FITTING
JACK ATTACHMENT INSERT

2-13. (cont)



f. Raise all jacks simultaneously at each corner of shelter to prevent excessive strain on jacks or shelter.

NOTE

The shelter shall be raised a minimum of 3 inches (7.6 cm) off ground.

g. Watch level indicators at each corner and adjust jacks as needed in order to level shelter.

2-14. AREA LIGHT INSTALLATION

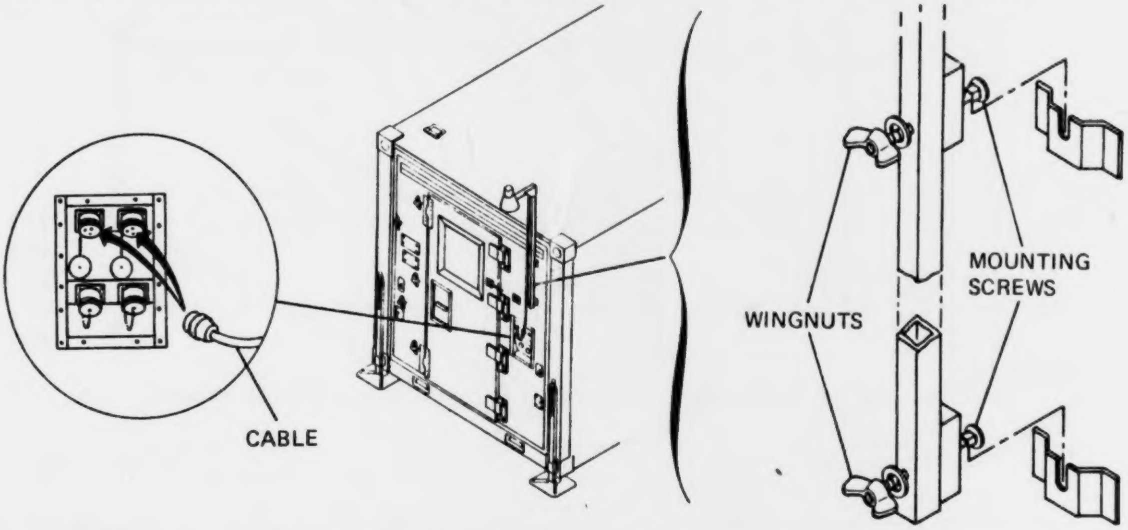
a. Loosen wingnuts and remove area light from stowage location inside shelter on front personnel end panel.

NOTE

Do not remove wingnuts from screws.

b. Remove bulb from equipment container and screw bulb into light socket.

c. Install the area light on the front or rear personnel endwall by mating the headed end of the mounting screws with the brackets provided.



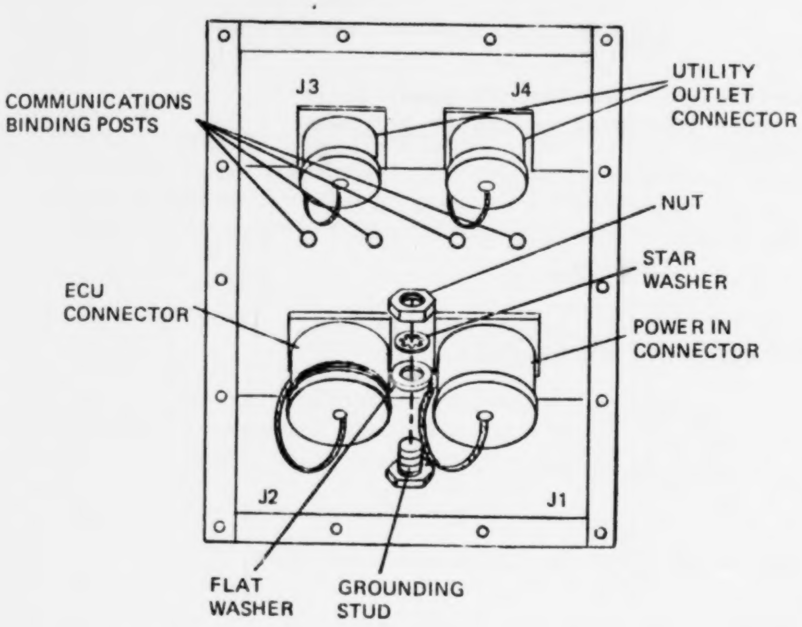
d. Secure the area light to the mounting brackets by tightening the two wingnuts.

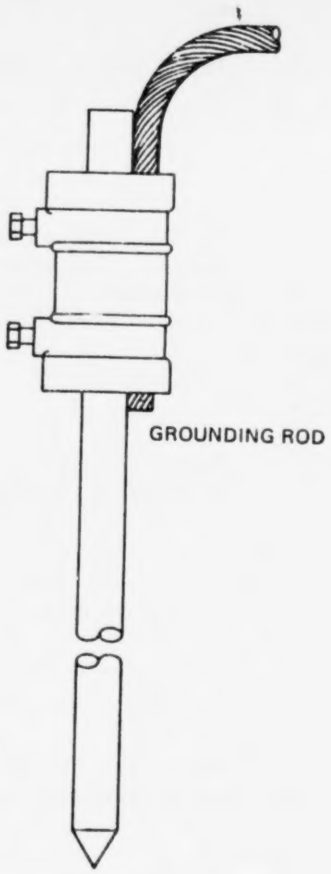
NOTE

When the area light is installed at the rear personnel end of shelter the cable is routed over the top of the shelter. The excess cable slack should be neatly coiled on the area light post so that it does not present a hazard to personnel.

e. Connect cable into J3 or J4 connectors on the power entry panel.

2-15. EXTERNAL CONNECTIONS.


COMMUNICATIONS BINDING POSTS
J3
J4
UTILITY OUTLET CONNECTOR
NUT
ECU CONNECTOR
STAR WASHER
POWER IN CONNECTOR
J2
J1
FLAT WASHER
GROUNDING STUD


GROUNDING ROD

a. Shelter grounding

WARNING

DEATH ON CONTACT
may result if shelter is used without grounding it first.

NOTE

Shelter is grounded through externally connected power supply. Additional grounding, depending on local conditions, may be installed by utilizing optional grounding rod, Appendix D.

(1) Drive ground rod into earth at a suitable location that permits ground cable attached to rod to reach ground stud on power entry panel.

(2) On power entry panel remove nut, star washer, and flat washer on stud.

(3) Connect ground cable connector to stud and secure with washer, star washer, and nut.

(4) Check all connections for security.

2-15. (cont)

b. Input power connection

WARNING

Do not attempt connection of live line to power entry panel. Deactivate power source or generator before procedure.

CAUTION

Power supply shall be 120/208VAC, 4 Wire with ground, 3 Phase or damage to equipment will result.

(1) Turn all circuit breakers to OFF position.

NOTE

Make certain that power entry panel and power supply cable are terminated with same type of connector.

(2) Connect power supply cable to power entry panel at connector (J1).

(3) Turn MAIN circuit breaker to ON position and observe any unusual conditions.

(4) Turn remaining circuit breakers to ON position one at a time and observe any unusual conditions.

c. ECU Connection.

(1) Turn CB1 to OFF position.

(2) Connect ECU supply cable to connector (J2).

(3) Turn CB1 to ON position and observe for any unusual conditions.

Section IV. OPERATION UNDER USUAL CONDITIONS

NOTE

If equipment fails to operate, refer to troubleshooting procedures in Chapter 3.

2-16. OPERATING INSTRUCTIONS. Due to the limited operating capability of shelter, operating instructions are limited to operation of circuit breakers and switches for the purpose of providing power to lights, outlets, fan, and externally connected environmental control unit (ECU), if installed.

Section V. OPERATION UNDER UNUSUAL CONDITIONS

2-17. GENERAL. This section provides instructions for operation of the shelter in unusual weather conditions. Operation during blackout conditions is also provided.

2-18. OPERATION IN RAIN AND/OR MUD

a. Provide adequate drainage ditch to prevent standing water around shelter area.

b. Check leveling jacks frequently for sinking; level shelter as required by adjusting container'lift jacks.

c. Close and secure all doors in shelter.

d. Check seals for proper placement and compression.

2-19. OPERATION IN SNOW, ICE OR EXTREME COLD

WARNING

In extreme cold, do not touch metal parts with bare hands. Severe skin damage may result.

a. Remove snow routinely with a soft bristle brush, broom, or equivalent.

b. Insure ECU is properly connected to shelter.

c. Keep all doors and vents closed.

2-19. (cont)

NOTE

Fluorescent lights have a delay time in coming on at temperatures of 0°F and below.

2-20. OPERATION IN HIGH WINDS.

NOTE

Two personnel are required to perform the following procedure.

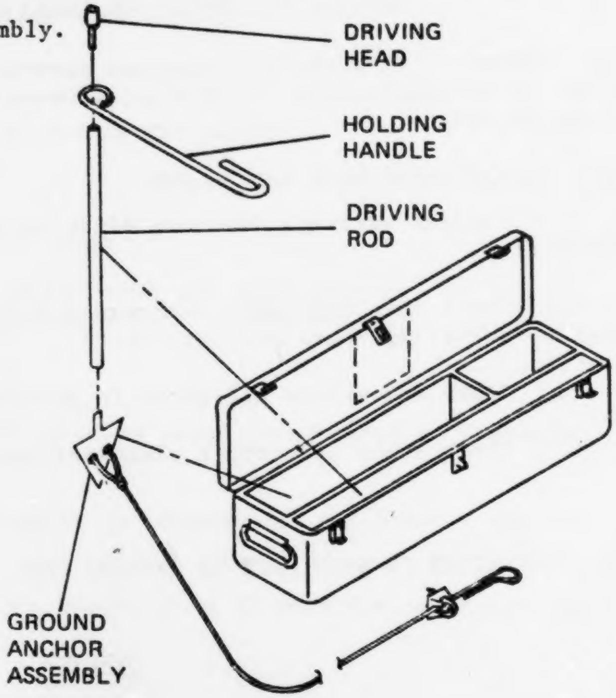
a. To install the storm configuration kit (tie-down installation which is found in the equipment container), use the following items:

(1) Ground anchor assembly.

(2) Driving rod.

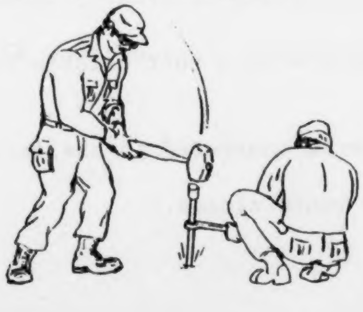
(3) Holding handle.

(4) Driving head.


DRIVING HEAD
HOLDING HANDLE
DRIVING ROD
GROUND ANCHOR ASSEMBLY

WARNING

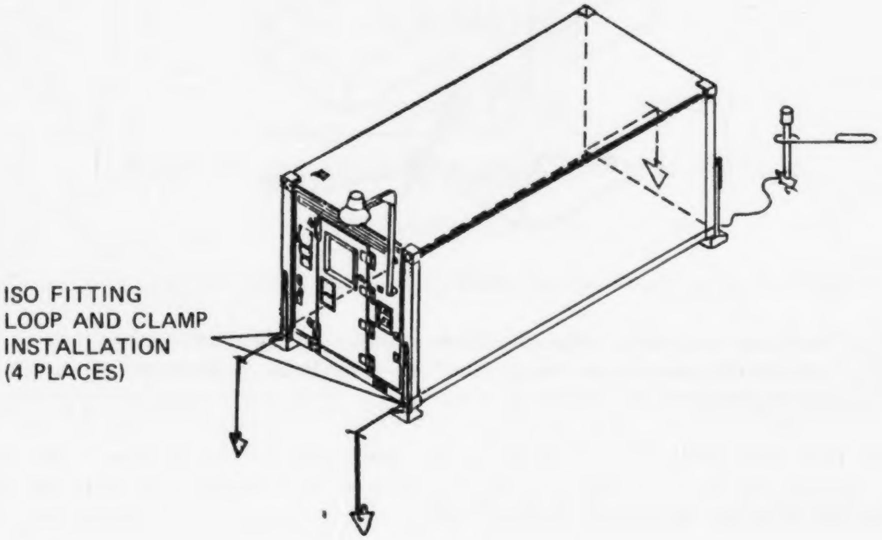
Safety glasses must be worn by personnel when installing ground anchors.



2-20. (cont)

b. One person shall support driving rod with holding handle, while second person drives ground anchor into ground using 12-pound sledge hammer, Appendix D.

c. Drive each of four loop and clamp ground anchors into ground approximately 3 feet (91.5 cm) deep, and as close as possible to the shelter attaching points, at locations indicated below.

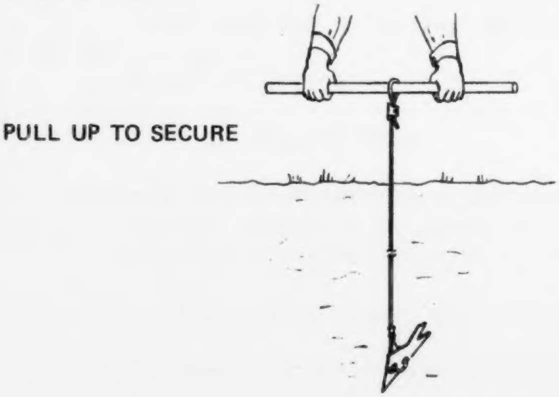


d. Set each ground anchor by forming a loop in cable end and secure loop with clamp.

e. Insert driving rod through loop and pull up sharply to ensure anchor is set into ground.

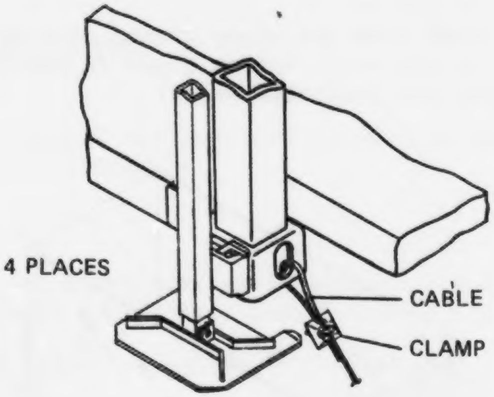
NOTE

This setting of the anchor is required to turn the anchor in the ground so that it develops maximum holding power.



2-20. (cont)

f. Remove clamp, loop cable at four places as shown. Replace clamp, pull cable tight and tighten clamp nuts.



NOTE

When moving shelter, disassemble storm configuration kit and cut cable as close to ground as possible. Discard cable components.

2-21. OPERATION DURING BLACKOUT CONDITIONS

NOTE

During blackout condition, enter and leave shelter through front personnel door only. Do not operate exterior area light.

a. Activate all interior lights and check from 25 feet (7.6 meters) away to ensure no light is visible.

b. Place blackout override switch to OFF position.

NOTE

Blackout override switch must remain in OFF position for duration.

CHAPTER 3

OPERATOR MAINTENANCE INSTRUCTIONS

Section I. TROUBLESHOOTING PROCEDURES

3-1. GENERAL. This section contains operator troubleshooting information for locating and correcting common malfunctions which may develop in shelter.

WARNING

HIGH VOLTAGE

exists in the electrical system of this equipment

DEATH ON CONTACT

may result if personnel fail to observe safety precautions.

a. Paragraph 3-2 lists common malfunctions which you may find during operation or maintenance of shelter electrical system or components. You should perform inspections and corrective actions in order listed.

b. All malfunctions that may occur and all inspections and corrective actions may not be listed. If a malfunction is not listed or is not corrected, notify your supervisor.

c. When troubleshooting operation of shelter electrical system, all switches and circuit breakers shall be placed in OFF positions with power connected.

d. The operator is limited to setting circuit breakers (ON/OFF), setting light assemblies in place, and replacing light bulbs.

3-2. OPERATOR TROUBLESHOOTING

MALFUNCTION
    TEST OR INSPECTION
        CORRECTIVE ACTION

---

1. NO POWER DISTRIBUTION TO SHELTER.

Step 1. Check that outside power is properly connected to service entrance connector on power entry panel and check general condition of cable and connectors.

a. Make proper power connection.

b. Check for defective cable or connectors.

3-2. (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 2. Check and reset main circuit breaker, and check outside power.

Notify organizational maintenance.

2. INCANDESCENT LIGHT FAILS TO COME ON.

Step 1. Check and reset circuit breaker.

Step 2. Check visually for burned out incandescent bulb.

Change bulb. (Refer to paragraph 4-10.)

Step 3. Check operation of incandescent light switch and blackout override switch.

Notify organizational maintenance.

WARNING

In the event of lamp breakage, care must be taken in removal of broken glass fragments and white phosphorous dust that may be dispersed within fixture. Inhalation of phosphorous dust could cause serious injury.

3. ALL FLUORESCENT LIGHTS FAIL TO COME ON.

Step 1. Check operation of fluorescent light switch and blackout override switch.

Step 2. Check and reset circuit breaker.

Notify organizational maintenance.

4. ONE OR MORE FLUORESCENT LIGHTS FAIL TO COME ON.

Check visually for burned out fluorescent lamps.

a. Turn off appropriate circuit breaker and replace lamp. (Refer to paragraph 4-11.)

b. Turn on appropriate circuit breaker.

3-2. (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

5. NO POWER AT ONE OR MORE INTERIOR UTILITY OUTLETS.

Check and reset associated circuit breakers.

Notify organizational maintenance.

6. NO POWER AT ONE OR BOTH EXTERIOR UTILITY OUTLETS.

Check and reset circuit breaker.

Notify organizational maintenance.

7. AREA LIGHT FAILS TO COME ON.

Step 1. Check and reset circuit breaker.

Step 2. Check visually for burned out bulb.

Change bulb. (Refer to paragraph 4-9).

Notify organizational maintenance.

8. NO POWER AT HEATER/AC SUPPLY.

Step 1. Check that outside power is properly connected to service entrance connector on power entry panel, and check general condition of cable and connectors.

a. Make proper power connection.

b. Check for defective cable or connectors.

Step 2. Check and reset circuit breakers.

Notify organizational maintenance.

9. FAN FAILS TO COME ON.

Step 1. Check and reset circuit breaker.

Step 2. Check operation of fan switches.

Notify organizational maintenance.

Section II. OPERATOR MAINTENANCE PROCEDURES

3-3 GENERAL. Authorized maintenance procedures to be performed by operator include replacement of area light assembly, replacement of light bulbs, closeout panels, ECU intake panel, ECU return panel, container lift jack assemblies, and storm configuration components.

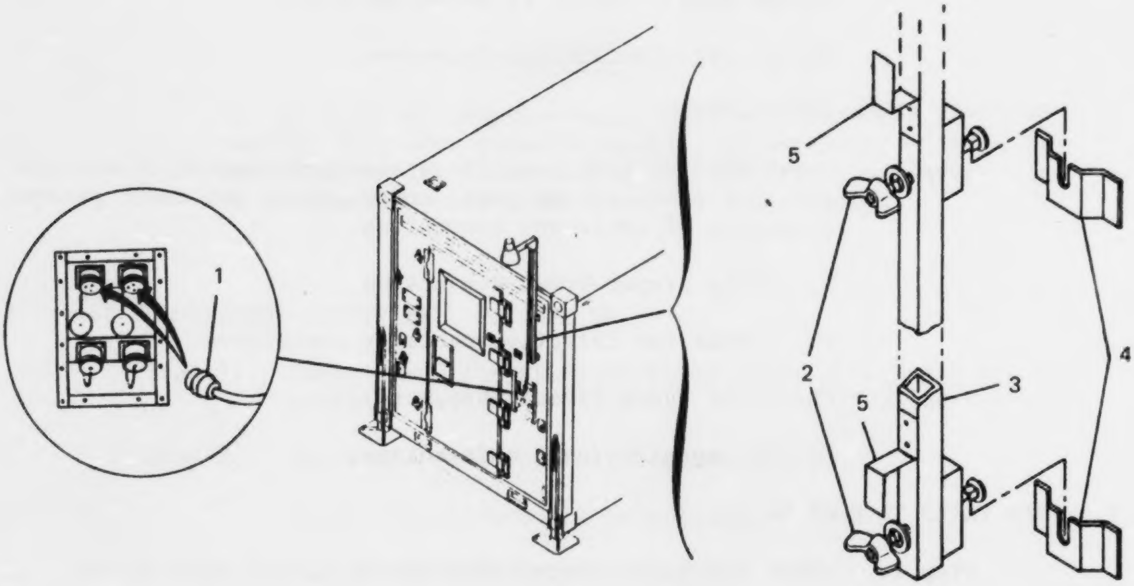
3-4. AREA LIGHT ASSEMBLY REPLACEMENT

This task covers:
  a. Removal
  b. Installation

WARNING

Disconnect power of circuit involved by setting circuit breaker to off position.

REMOVAL



1. Place circuit breaker CB8 to off position. (Refer to page 2-2 for location.)

3-4. (cont)

2. Disconnect area light assembly connector (1) from power entry panel.

3. Loosen two wingnuts (2) and lift area light assembly (3) from two brackets (4) on shelter.

4. Coil cable on brackets (5) on light post.

INSTALLATION

1. Position post of area light assembly (3) in two brackets (4) on shelter and tighten two wingnuts (2) to secure light to shelter.

2. Connect area light assembly connector (1) to power entry panel.

3. Place circuit breaker CB8 to on position.

3-5. CLOSEOUT, ECU INTAKE, AND ECU RETURN PANELS REPLACEMENT

This task covers:
a. Removal
b. Installation

INITIAL SETUP

Standard Tools
General mechanics tool kit
Personnel - 2
References
Applicable ECU manual.

REMOVAL

1. If environmental control unit (ECU) panels are installed and ECU is operating, shut down ECU. (Refer to applicable ECU manual.)

2. Disconnect ECU ducts. (Refer to applicable ECU manual.)

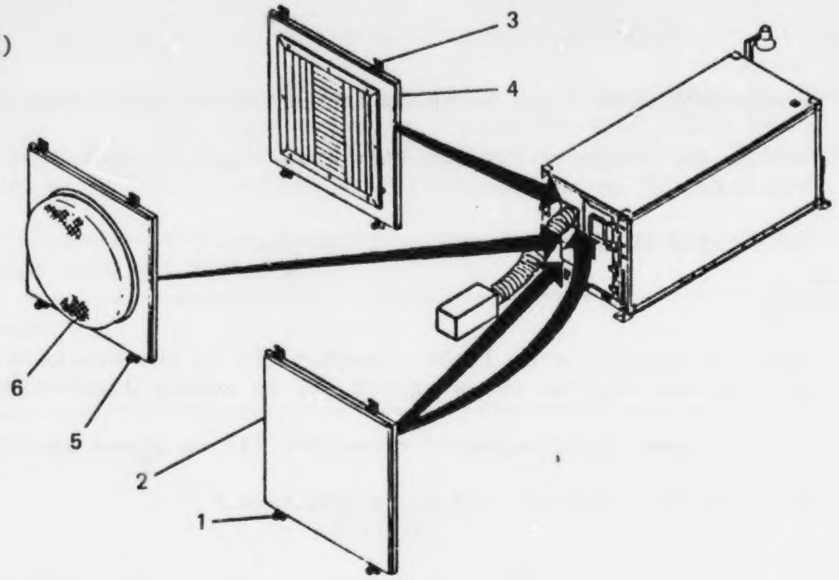
Closeout Panels

3. Inside shelter, loosen four captive screws (1) and remove closeout panel (2).

ECU Intake Panel

Inside shelter, loosen four captive screws (3) and remove ECU intake panel (4).

3-5. (cont)



ECU Return Panel

Inside shelter, loosen four captive screws (5) and remove ECU return panel (6).

INSTALLATION

NOTE

ECU intake panel (4) and ECU return panel (6), or closeout panels (2) are stowed in roof panel when not in use.

ECU Return Panel

Position ECU return panel (6) in frame opening and secure by tightening four captive screws (5).

ECU Intake Panel

Position ECU intake panel (4) in frame opening and secure by tightening four captive screws (3).

Closeout Panels

1. Position closeout panel (2) in frame opening and secure by tightening four captive screws (1).

2. Connect ECU ducts and turn on ECU. (Refer to applicable ECU manual.)

3-6. CONTAINER LIFT JACK ASSEMBLY REPLACEMENT

This task covers:
- a. Removal
- b. Cleaning, Inspection
- c. Installation

INITIAL SETUP

Standard tools General mechanics tool kit	Personnel - 2

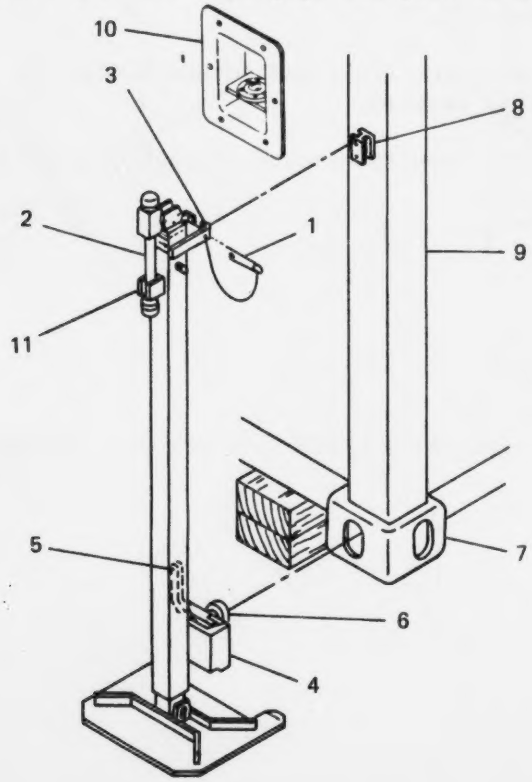
REMOVAL

1. Place sufficient blocks under ISO fitting or base frame to prevent settling of shelter when jack is removed.

NOTE

Stencil on jack indicates handle rotation to raise or lower jack.

2. Rotate handle (2) to lower jack until upper (3) and lower jack attachments (4) will disengage and jack is not supporting shelter.



3-6. (cont)

3. Turn locking handle (5) to rotate insert (6) in ISO fitting (7).
4. Remove safety pin (1).
5. Remove jack.

CLEANING, INSPECTION

1. Wipe jack assembly and component surfaces.
2. Inspect mounting surfaces for corrosion and damage.
3. Inspect for missing or damaged components.
4. Inspect for corrosion or paint damage.

INSTALLATION

1. Rotate handle (2) to raise jack until insert (6) will enter lower ISO fitting (7) and upper jack attachment (3) engages jack support bracket (8) on corner post (9).
2. Turn locking handle (5) to rotate insert (6) in ISO fitting (7).
3. Install safety pin (1) through jack support bracket (8) under upper jack attachment (3).
4. Watch level indicator (10), and rotate handle (2) to raise jack until shelter is leveled.
5. Swing handle (2) down and secure in locking clip (11).
6. Remove blocks.

3-7. STORM CONFIGURATION COMPONENTS REPLACEMENT

This task covers:
- a. Removal
- b. Installation

INITIAL SETUP

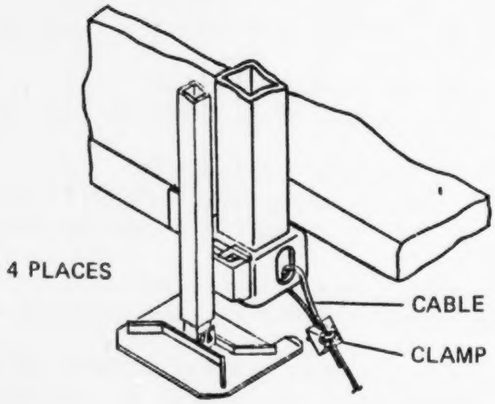
Standard Tools
General mechanics tool kit
Personnel - 2

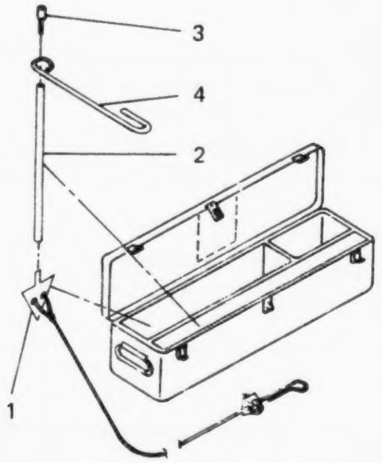
References
Operation in High Winds, paragraph 2-20

REMOVAL

1. Release cable by loosening cable clamp (4 places).

2. Remove cable from ISO fitting (4 places).





INSTALLATION

Refer to paragraph 2-20 for installation of storm configuration components.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

4-1. COMMON TOOLS AND EQUIPMENT.

a. Appendix B, Section III contains the authorized common tools.

b. For authorized equipment refer to Modified Table of Organization and Equipment (MTOE) applicable to your unit.

4-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

a. A special tool, hand blind riveter, Appendix B, Item 2 is used for shelter skin repair and general riveting utilizing blind rivets.

b. Installation tool, Appendix B, Item 3 is used for installation of captive screws.

c. Portable electric router, Appendix B, Item 14 is used to cut out panels. Use tripod base heat lamp, Appendix B, Item 15 during panel repair.

d. Fastener header, Appendix B, Item 7 or 8 and box end or adjustable wrench, Appendix B, Item 9 are used to install non-potted inserts.

e. Multimeter, Appendix B, Item 4, is used to perform all continuity/voltage tests on shelter. Electric tool kit, Appendix B, Item 5 is used to repair wiring.

f. Use crimping tool, Appendix B, Item 10, to attach wires to receptacle pins on power entry panel.

4-3. REPAIR PARTS.

Repair parts covering organizational maintenance for this shelter are listed and illustrated in TM 10-5411-202-24P.

Section II. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS).

PMCS are designed to keep the equipment in good working condition by performing certain tests, inspections, and services. The intervals provide you, the organizational technician, with time schedules that determine when to perform specified tasks.

a. **Before you operate.** Always keep in mind the CAUTIONS and WARNINGS. Perform your before (B) PMCS.

b. **While you operate.** Always keep in mind the CAUTIONS and WARNINGS. Perform your during (D) PMCS.

c. **After you operate.** Be sure to perform your after (A) PMCS.

d. **If your equipment fails to operate.** Troubleshoot with proper equipment. Report any deficiencies using the proper forms. See DA PAM 738-750.

Table 4-1. Organizational Preventive Maintenance Checks and Services

B - Before D - During M - Monthly

Item No.	Interval			Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary	For Readiness reporting, equipment is Not Ready/ Available if:
	B	D	M			
WIRING						
1	●	●	●	Wiring	Inspect for damage or disconnection	Wiring damaged or disconnected
CONTAINER LIFT JACK ASSEMBLIES						
2	●	●	●	Container lift jack assemblies	a. Inspect for sinking into ground if shelter not level (check frequently during rainy conditions). b. Inspect for condition and security	a. Shelter not level b. Jacks damaged or insecure

Section III. TROUBLESHOOTING PROCEDURES

4-4. GENERAL. This Section contains organizational troubleshooting information for locating and correcting common malfunctions which may develop in shelter electrical system.

WARNING

The shelter contains voltages that are dangerous if contacted. Take appropriate precautions when troubleshooting. Before performing continuity checks or replacing electrical components, make sure that electrical power is disconnected from circuit involved.

4-5. TROUBLESHOOTING. Each malfunction for an individual component or unit is listed in paragraph 4-6. The malfunction is followed by a list of tests or inspections which help to determine probable causes and corrective actions to take. The tests or inspections and corrective actions are to be performed in the order listed in the table. All malfunctions that may occur and all tests or inspections and corrective actions may not be listed. If a malfunction is not listed or is not corrected by corrective action, notify your supervisor. Unless otherwise noted, when troubleshooting operation of shelter electrical system, all switches and circuit breakers shall be placed in operating positions with power connected. The electrical system schematic diagram (4-39) and wire list (4-40) are located at the end of Chapter 4, Section IV.

4-6. ORGANIZATIONAL MAINTENANCE TROUBLESHOOTING

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

1. NO POWER DISTRIBUTION TO SHELTER.

Step 1. Check that outside power is properly connected to service entrance on power entry panel, check general condition of cable and connectors. Test operation of power entry panel.

a. Replace defective wiring (paragraph 4-8).

b. Replace defective connectors (paragraph 4-8).

Step 2. Test operation of main circuit breaker and wiring (paragraph 4-7).

a. Replace defective wiring (paragraph 4-7).

b. Replace defective circuit breaker (paragraph 4-7).

2. INCANDESCENT LIGHT FAILS TO COME ON.

Step 1. Check visually for burned out bulb.

Replace bulb (paragraph 4-10).

Step 2. Test operation of incandescent light switch (S3), blackout override switch (S1) and wiring (paragraph 4-10).

a. Replace defective wiring (paragraph 4-10).

b. Replace defective switch (paragraph 4-10).

Step 3. Check and reset circuit breaker CB6.

Replace defective circuit breaker (paragraph 4-7).

3. ALL FLUORESCENT LIGHTS FAIL TO COME ON.

Step 1. Check and reset circuit breaker CB6.

Replace defective circuit breaker (paragraph 4-7).

4-6. (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 2. Test operation of fluorescent light switch (S4), blackout override switch (S1), and wiring (paragraph 4-7).

a. Replace defective wiring (paragraph 4-7).

b. Replace defective switch (paragraph 4-7).

4. ONE OR MORE FLUORESCENT LIGHTS FAIL TO COME ON.

Step 1. Check visually for burned out fluorescent lamps.

Replace lamp, (paragraph 4-11).

Step 2. Test operation of fluorescent light fixture and wiring (paragraph 4-11).

a. Replace defective wiring (paragraph 4-11).

b. Replace defective light fixture (paragraph 4-11).

WARNING

In the event of lamp breakage, care must be taken in removal of broken glass fragments and white phosphorous dust that may be dispersed within fixture. Inhalation of phosphorous dust could cause dangerous injury.

5. NO POWER AT ONE OR MORE UTILITY OUTLETS.

Step 1. Check and reset associated circuit breaker CB3 or CB5.

Replace defective circuit breaker (paragraph 4-7).

Step 2. Test operation of utility outlet and wiring (paragraph 4-12).

a. Replace defective wiring (paragraph 4-12).

b. Replace defective outlet (paragraph 4-12).

4-6. (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

6. NO POWER AT ECU SUPPLY CONNECTOR.

Step 1. Check and reset circuit breaker CB1.

Replace defective circuit breaker (paragraph 4-7).

Step 2. Test operation of connector and wiring (paragraph 4-8).

a. Replace defective wiring (paragraph 4-8).

b. Replace defective connector (paragraph 4-8).

7. NO POWER AT ONE OR BOTH EXTERIOR UTILITY OUTLETS.

Step 1. Check and reset circuit breaker CB8.

Replace defective circuit breaker (paragraph 4-7).

Step 2. Test operation of associated exterior utility outlet and wiring (paragraph 4-12).

a. Replace defective wiring (paragraph 4-12).

b. Replace defective outlet (paragraph 4-12).

8. FAN FAILS TO OPERATE.

Step 1. Check and reset circuit breaker CB4.

Replace defective circuit breaker (paragraph 4-7).

Step 2. Check associated cables, connectors, and outlets for proper connectors or defects.

If items are defective, contact direct support maintenance.

Step 3. Check fan for defects.

Replace defective fan (paragraph 4-15).

Section IV. ORGANIZATIONAL MAINTENANCE PROCEDURES

This section contains the following maintenance procedures for the shelter.

LIST OF FUNCTIONS

Function No.	Function	Function Ref. (paragraph)
1	Circuit Breaker Panel Assembly Testing, Replacement and Repair	4-7
2	Power Entry Panel Assembly Testing, Replacement and Repair	4-8
3	Area Light Assembly Testing and Repair	4-9
4	Incandescent Light Assembly Testing, Replacement and Repair	4-10
5	Ceiling Light Testing, Replacement and Repair	4-11
6	Receptacle Outlets Testing, Replacement, and Repair	4-12
7	Wall Switches Replacement	4-13
8	Blackout Switch Replacement, Repair, and Adjustment	4-14
9	Fan Assembly Testing and Replacement	4-15
10	Wiring Testing, Replacement and Repair	4-16
11	Personnel Door Replacement, Repair and Alignment	4-17
12	Container Lift Jack Assemblies Service and Repair	4-18
13	Front Endwall Panel Replacement and Repair	4-19
14	Rear Endwall Panel Replacement and Repair	4-20
15	Sidewall Panel Replacement and Repair	4-21
16	Roof Panel Assembly Repair	4-22
17	Floor Panel Repair	4-23
18	Equipment Container Replacement and Repair	4-24
19	Drying Water-Soaked Areas In Panels	4-25
20	Blind Rivet Removal and Installation	4-26
21	Repair of Small Dent or Depression	4-27
22	Repair of Depression or Small Puncture	4-28
23	Repair of Puncture With Minimal Damage to Core	4-29
24	Repair of Puncture With Core Fracture	4-30
25	Repair of Damage With Extended Cracks	4-31
26	Repair of Puncture Through One Skin and Core	4-32
27	Repair of Puncture Through Both Skins and Core	4-33
28	Shelter Body Seals Replacement	4-34
29	Threaded Inserts Replacement	4-35
30	Caulking Repaired Areas	4-36
31	Paint Refinishing	4-37
32	Decal Removal/Replacement	4-38
33	Electrical System Schematic Diagram	4-39
34	Wire List	4-40

4-7. CIRCUIT BREAKER PANEL ASSEMBLY

This task covers:

a. Testing
b. Removal
c. Disassembly
d. Cleaning, Inspection
e. Repair
f. Assembly
g. Installation

INITIAL SETUP

Standard Tools
General mechanics tool kit

Test Equipment
Multimeter, Appendix B, Item 4
Electrical tool kit, Appendix B, Item 5

Personnel Required
Electrician

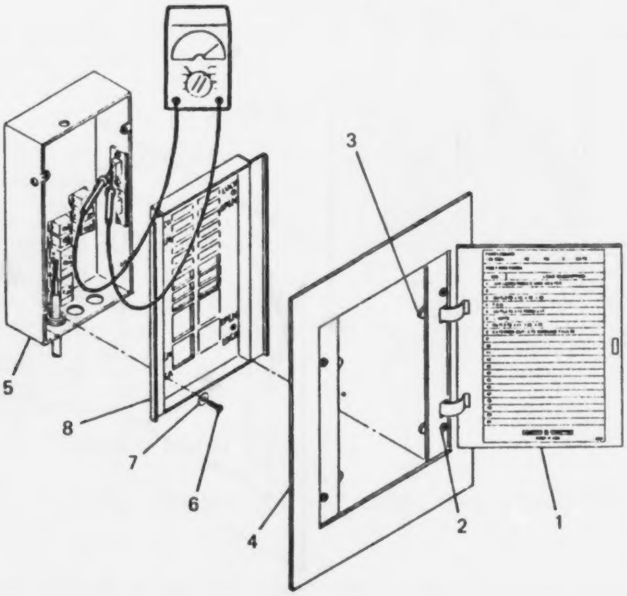
WARNING

Disconnect all power sources from power entry panel assembly before testing.

TESTING

1. Disconnect site power

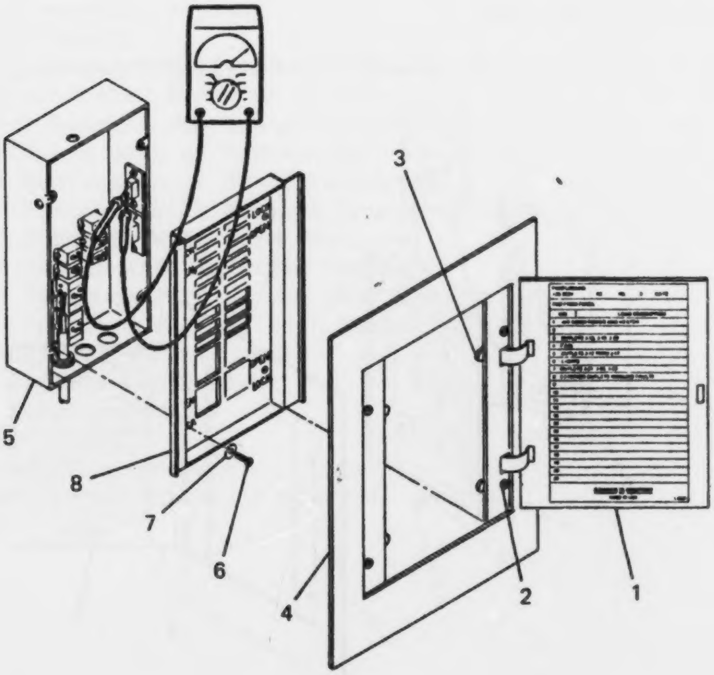
2. Set all circuit breakers and switches to OFF position.



3. Open circuit breaker panel door (1).

4-7. (cont)

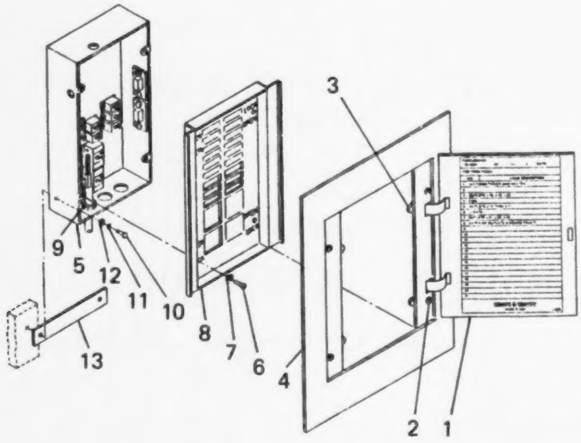
4. Loosen four captive screws (2) and move four clamp fingers (3) to OPEN position.
5. Lift circuit breaker panel cover (4) from circuit breaker box (5).
6. Remove four screws (6) and washers (7) and lift panelboard (8) from circuit breaker box (5).
7. Reconnect site power.
8. Set main circuit breaker to ON position.
9. Set branch circuit breakers to ON position and observe if any breakers pop to OFF position.
10. Disconnect site power.
11. Using multimeter, check for continuity at circuit breakers, light switches, and wiring.
12. If no continuity is present, contact direct support maintenance.



4-7. (cont)

REMOVAL

1. Disconnect site power.
2. Set all circuit breakers and switches to OFF position.
3. Open circuit breaker panel door (1).
4. Loosen four captive screws (2) and move four clamp fingers (3) to OPEN position.



5. Lift circuit breaker panel cover (4) from circuit breaker box (5).
6. Remove four screws (6) and washers (7) and lift panelboard (8) from circuit breaker box (5).

NOTE

Tag all wires for reconnection.

7. Disconnect wires (9) from circuit breakers and switches.
8. Remove screws (10), lockwashers (11), and washers (12), and separate circuit breaker panel assembly (5) and spacer (13) from front endwall panel.

DISASSEMBLY

1. Open circuit breaker panel door (1).
2. Loosen four captive screws (2) and move four clamp fingers (3) to OPEN position.
3. Lift circuit breaker panel cover (4) from circuit breaker box (5).

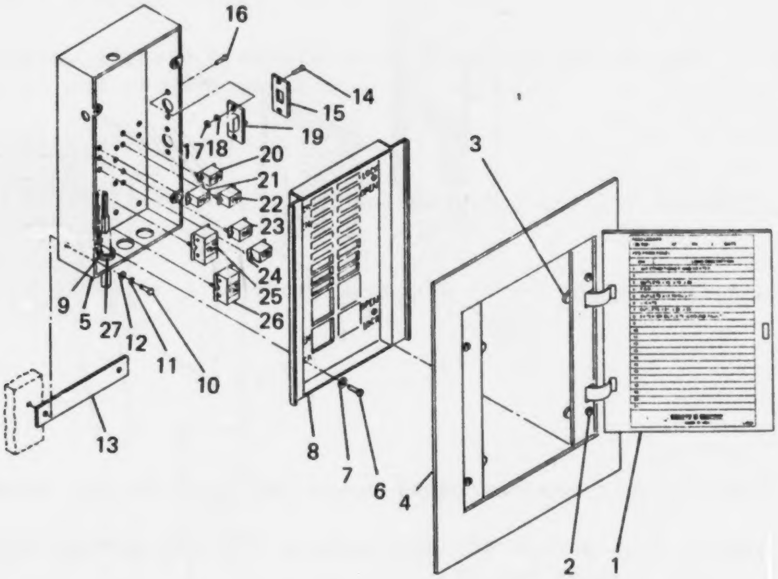
4-7. (cont)

4. Remove four screws (6) and washers (7) and lift panelboard (8) from circuit breaker box (5).

NOTE

Tag all wires for reconnection.

5. Disconnect wires (9) from light switches (19) and circuit breakers (20 through 26).



6. Remove four screws (14) and two switch covers (15).

7. Remove four screws (16), nuts (17), and lockwashers (18), and remove two light switches (19) from circuit breaker box (5).

8. Remove circuit breakers (20 through 26) from circuit breaker box (5).

9. Remove grommets (27) from circuit breaker box (5).

CLEANING, INSPECTION

1. Wipe circuit breaker panel and components surfaces:

NOTE

Do not use water to clean circuit breaker panel assembly.

4-7. (cont)

2. Inspect mounting surfaces for corrosion and damage.
3. Inspect panel wiring for cracks, tears, burns, or other damage.
4. Inspect for damaged circuit breakers or light switches.

REPAIR

1. Replace damaged circuit breakers or light switches.
2. Repair or replace damaged wiring.
3. Repair corrosion or paint damage. (Refer to 4-37.)

ASSEMBLY

1. Install grommets (27) in circuit breaker box (5).
2. Install circuit breakers (20 through 26) in circuit breaker box (5).
3. Connect wires (9) to circuit breakers (20 through 26). (Refer to 4-40.)
4. Position two light switches (19) in circuit breaker box (5) and secure with four screws (16), nuts (17), and lockwashers (18).
5. Position two switch covers (15) over light switches (19) and secure with four screws (14).
6. Connect wires (9) to light switches (19). (Refer to 4-40.)
7. Position panelboard (8) over circuit breakers (20 through 26) in circuit breaker box (5) and secure with four screws (6) and washers (7).
8. Position circuit breaker panel cover (4) against circuit breaker box (5) and secure by moving four clamp fingers (3) to LOCK position and tightening four captive screws (2).
9. Close circuit breaker panel door (1).

4-7. (cont)

INSTALLATION

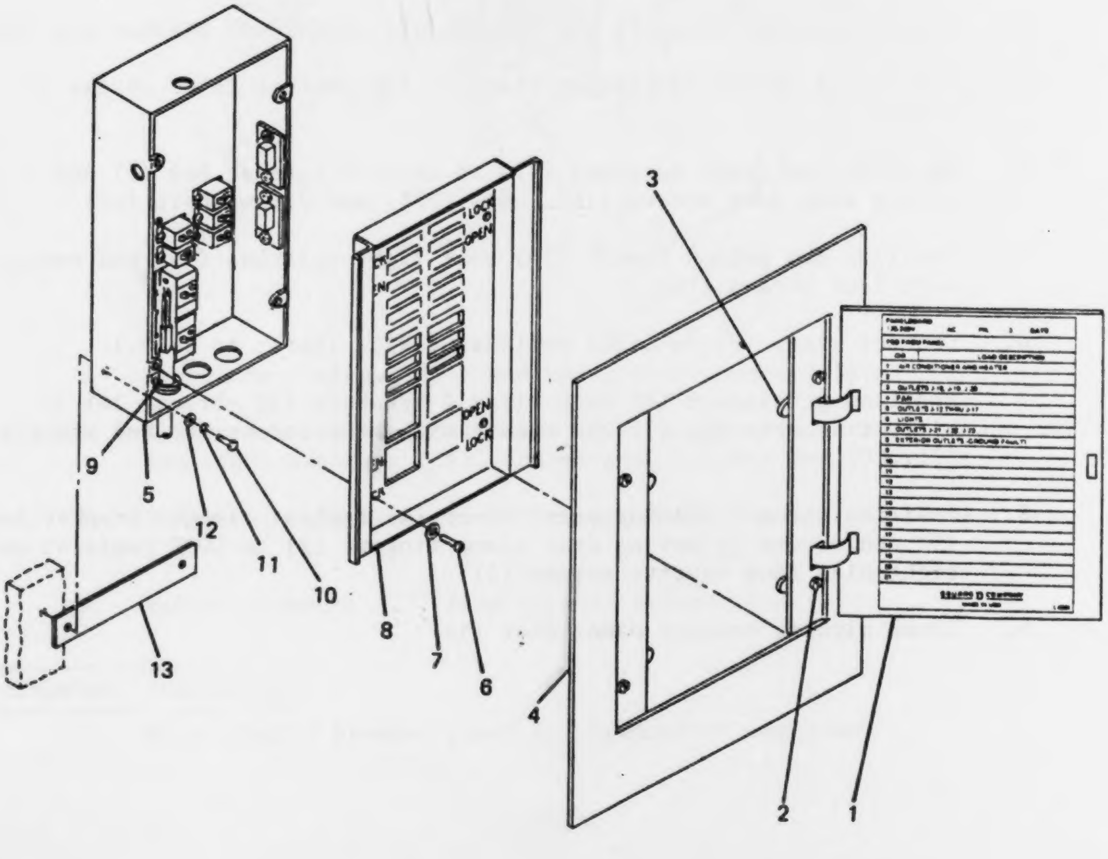
1. Position spacer (13) and circuit breaker panel box (5) against front endwall panel and secure with screws (10), lockwashers (11), and washers (12).

2. Connect wires (9) to light switches and circuit breakers. (Refer to 4-40.)

3. Position panelboard (8) over circuit breakers in circuit breaker box (5) and secure with four screws (6) and washers (7).

4. Position circuit breaker panel cover (4) against circuit breaker box (5) and secure by moving four clamp fingers (3) to lock position and tightening four captive screws (2).

5. Close circuit breaker panel door (1).



4-8. POWER ENTRY PANEL ASSEMBLY

This task covers:

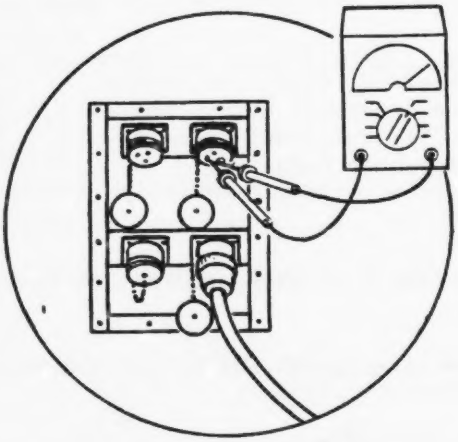
- a. Testing
- b. Removal
- c. Disassembly
- d. Cleaning, Inspection
- e. Repair
- f. Assembly
- g. Installation

INITIAL SETUP

Standard Tools
  General mechanics tool kit
  Electrical Tool Kit
Test Equipment
  Multimeter, Appendix B, Item 4

Personnel Required
  Electrician

TESTING



1. Connect site power.

2. Unscrew connector covers from connectors.

3. Set all circuit breakers in ON position.

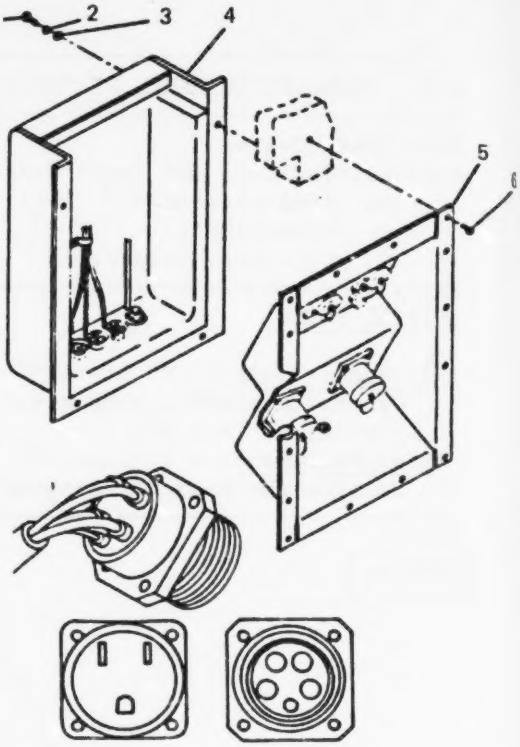
4. Using multimeter, check for proper voltage at each receptacle pin.

5. If improper voltage is present, replace defective receptacles, terminals/connectors, or panel wiring.

WARNING

Disconnect all power sources from power entry panel assembly before removing.

4-8. (cont)



REMOVAL

1. Inside shelter, remove screws (1), lockwashers (2), and washers (3), and carefully lift cover assembly (4) away from front endwall panel as far as it will go.

NOTE

Tag all wires for reconnection

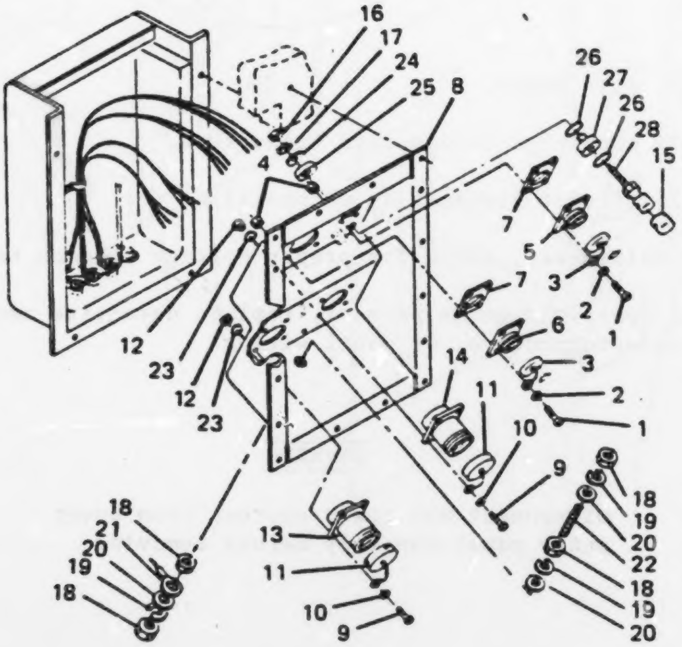
2. Disconnect wires at receptacles and terminals/connectors from back of power entry panel assembly (5).

3. Outside shelter, drill out rivets (6) and remove power entry panel assembly (5) from front endwall panel. (Refer to 4-26.)

DISASSEMBLY

1. Remove screws (1), lockwashers (2), receptacle covers (3), and nuts (4).

2. Remove receptacles (5 and 6) and gaskets (7) from panel (8).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4-8. (cont)

3. Remove screws (9), lockwashers (10), receptacle covers (11), nuts (12), and washers (23).

4. Remove receptacles (13 and 14) from panel (8).

5. Remove rubber cap (15), nut (16), lockwasher (17), brass washer (24), nylon washer (25), two O-rings (26), nylon washer (27), and binding post body (28) from panel (8).

6. Remove four nuts (18), three lockwashers (19), three washers (20), terminal lug (21), and threaded stud (22) from panel (8).

CLEANING, INSPECTION

1. Wipe power entry panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for damaged receptacles, binding posts, terminals, or threaded stud.

REPAIR

1. Replace damaged receptacles, binding posts, terminals, or threaded stud.

2. Repair corrosion or paint damage. (Refer to 4-37.)

ASSEMBLY

1. Install threaded stud (22), terminal lug (21), three washers (20), three lockwashers (19), and four nuts (18) in panel (8).

2. Install binding post body (28), nylon washer (27), two O-rings (26), nylon washer (25), brass washer (24), lockwasher (17), nut (16), and rubber cap (15) in panel (8).

3. Using crimping tool, attach wires to receptacle pins. (Refer to 4-40.)

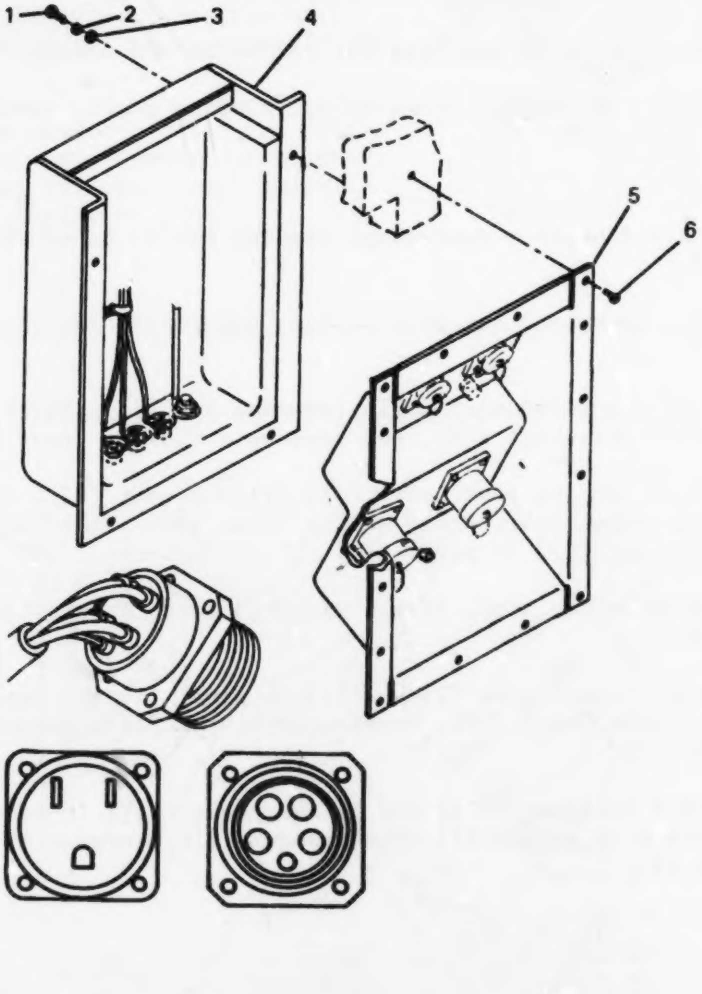
4. Install receptacles (13 and 14) in panel (8) and secure with screws (9), lockwashers (10), receptacle covers (11), washers (23), and nuts (12).

5. Install receptacles (5 and 6) and gaskets (7) in panel (8) and secure with screws (1), lockwashers (2), receptacle covers (3), and nuts (4).

4-8. (cont)

INSTALLATION

1. Position power entry panel assembly (5) against outside of front endwall panel and secure with rivets (6). (Refer to 4-26.)
2. Connect wires to receptacles and terminals/connectors at rear of power entry panel assembly (5). (Refer to 4-40.)
3. Position cover assembly against inside of front endwall panel and secure with screws (1), lockwashers (2), and washers (3).
4. Reconnect electrical power to service entrance receptacle.



4-9. AREA LIGHT ASSEMBLY

This task covers:

a. Testing
b. Disassembly
c. Cleaning, Inspection
d. Repair
e. Assembly

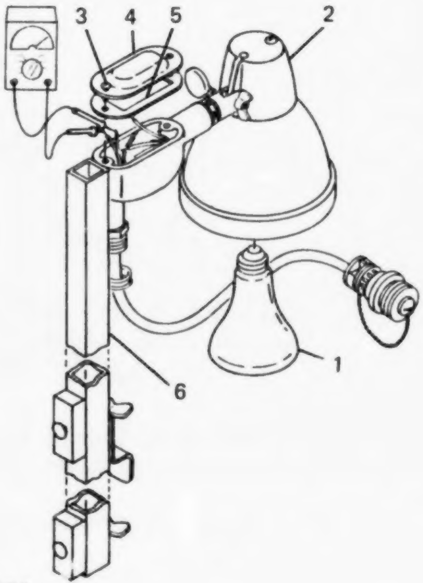
INITIAL SETUP

Special Tools
Hand blind riveter, Appendix B, Item 2
Test Equipment
Multimeter, Appendix B, Item 4
Standard Tools
General mechanics tool kit
Electrical tool kit

Personnel
Electrician
Sheet metal worker
Equipment Condition
Area light assembly removed (3-4)
All circuit breakers and switches in OFF position

WARNING

The light assembly contains voltage that is dangerous if contacted.



TESTING

1. Remove flood light (1) from lamp holder (2).

2. Unscrew two captive screws (3) and remove conduit outlet cover (4) and gasket (5) from exterior light post (6).

3. Using multimeter, check for continuity at lamp socket and wiring.

4. If no continuity is present, replace defective lamp or wiring.

DISASSEMBLY

1. Unscrew flood light (1) from lamp holder (2).

2. Remove wing nut (3) and thumb screw (4) from lamp holder (2).

3. Unscrew two captive screws (5) and remove conduit outlet cover (6) and gasket (7).

4. Remove three wire nuts (8) and separate three wires in lamp holder (2) from three wires of electrical cord (9) in exterior light post (10).

4-9. (cont)

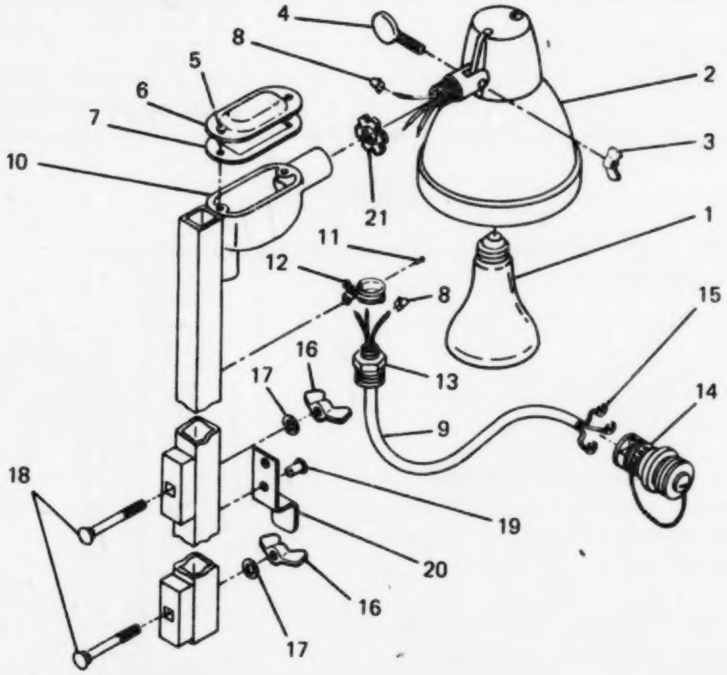
5. Separate lamp holder (2) from exterior light post (10).

6. Remove locknut (21).

7. Rotate screw on clamp (12) one-quarter turn, open clamp (12), and remove electrical cord (9).

8. Drill out two rivets (11) and remove clamp (12) from exterior light post (10). (Refer to 4-26.)

9. Remove electrical cord (9) from exterior light post (10).



10. Separate liquid tight connector (13) and connector (14) from electrical cord (9).

11. Remove three terminal lugs (15) from three wires in electrical cord (9).

12. Remove two wing nuts (16), washers (17), and bolts (18) from exterior light post (10).

13. Drill out four rivets (19) and remove two cord stowage brackets (20) from exterior light post (10). (Refer to 4-26.)

CLEANING, INSPECTION

1. Wipe area light assembly and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

4-9. (cont)

3. Inspect for and replace if necessary:

   a. Missing or damaged components,

   b. Corrosion or paint damage.

REPAIR

Repair corrosion or paint damage. (Refer to 4-37.)

ASSEMBLY

1. Position two cord stowage brackets (20) on exterior light post (10) and install four rivets (19). (Refer to 4-26.)

2. Install two bolts (18), washers (17), and wing nuts (16) in exterior light post (10).

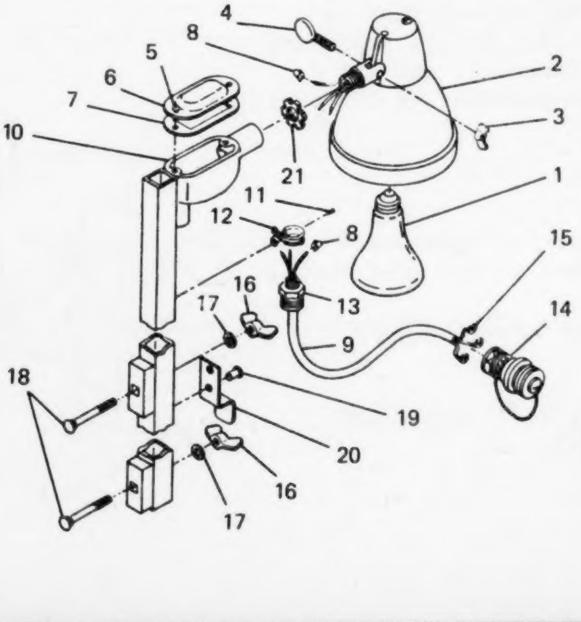
3. Assemble three terminal lugs (15) to three wires on one end of electrical cord (9) and attach connector (14) at that end.

4. Place electrical cord (9) through clamp (12) and attach clamp to exterior light post with two rivets (11) and close clamp. (Refer to 4-26.)

5. Assemble liquid tight connector (13) to opposite end of electrical cord (9) and install assembly in exterior light post (10). Make sure three wires extend through opening at top of exterior light post (10).

6. Assemble locknut (21) on lamp holder (2).

7. Assemble lamp holder (2) to exterior light post (10) and install thumb screw (4) and wing nut (3). Make sure three wires extend through opening at top of exterior light post (10).



4-9. (cont)

8. Connect three wires from electrical cord (9) to three wires from lamp holder (2) as follows:

From Electrical Cord	To Lamp Holder
Black Wire	Black Wire
White Wire	White Wire
Green Wire	Bare Wire

9. Secure these wires with three wire nuts (8).

10. Make sure connected wires are positioned in opening at top of exterior light post (10) and assemble gasket (7) and outlet cover (6) to top of exterior light post (10) with two captive screws (5).

11. Install flood light (1) in lamp holder (2).

4-10. INCANDESCENT LIGHT ASSEMBLY

This task covers.

- a. Testing
- b. Removal
- c. Cleaning, Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Standard Tools
General mechanics tool kit
Electrical tool kit

Test Equipment
Multimeter, Appendix B, Item 4

Personnel
Electrician

WARNING

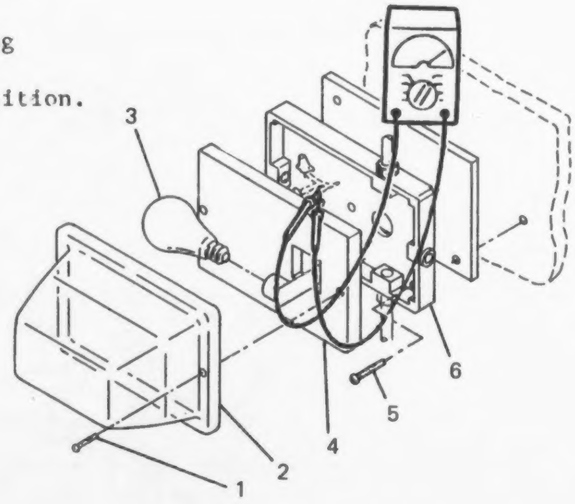
This fixture contains voltage that is dangerous if contacted. Before replacing incandescent light assembly, set all circuit breakers and switches to OFF position.

TESTING

1. Set all circuit breakers and switches to OFF position.

2. Remove two screws (1) and cover (2).

3. Unscrew bulb (3) from light fixture (4).

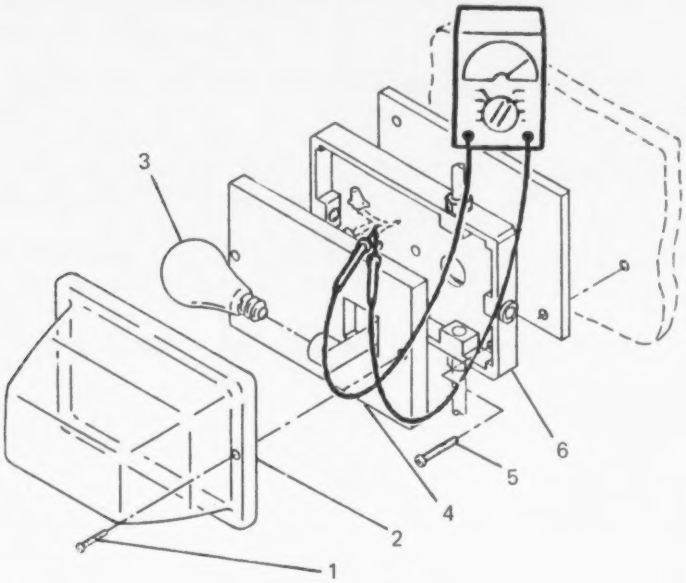


4-10. (cont)

4. Remove screw (5) and separate light fixture (4) from light fixture adapter (6) as far as it will go.

5. Using multimeter, check for continuity at bulb socket and wiring.

6. If no continuity is present, replace defective light fixture or wiring.



REMOVAL

1. Remove two screws (1) and switch cover (2).

2. Remove two screws (3) and pull switch (4) from outlet box (27) as far as it will go.

NOTE

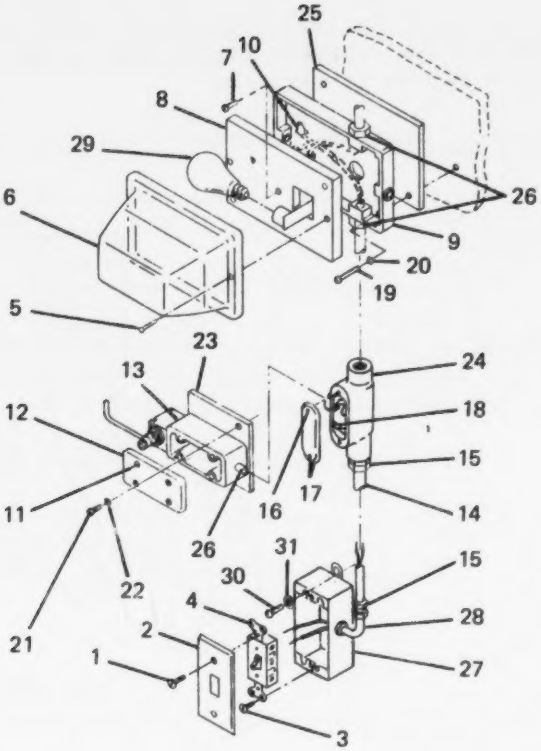
Tag wires for reconnection.

3. Disconnect wires at rear of switch (4).

4. Remove two screws (5) and light fixture cover (6). Remove bulb (29).

5. Remove screw (7) and separate light fixture (8) from light fixture adapter (9) as far as it will go.

4-10. (cont)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27
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3

NOTE

Tag wires for reconnection.

6. Remove wire nuts (10) and disconnect wires from rear of light fixture (8).

7. Loosen four captive screws (11) and remove limit switch cover (12).

NOTE

Tag wires for reconnection.

8. Disconnect three sets of wires plus one ground wire inside limit switch (13).

9. Loosen two captive screws (16) and remove cover (17) and gasket (18) from outlet conduit (24).

10. Disconnect wires in outlet conduit (24).

11. Pull wires up through lower conduit (14) and into light fixture adapter (9).

4-10. (cont)

12. Remove two screws (30) and lockwashers (31), and remove outlet box (27) from endwall.

13. Loosen two connectors (15) between outlet conduit (24) and elbow connector (28), and remove conduit (14).

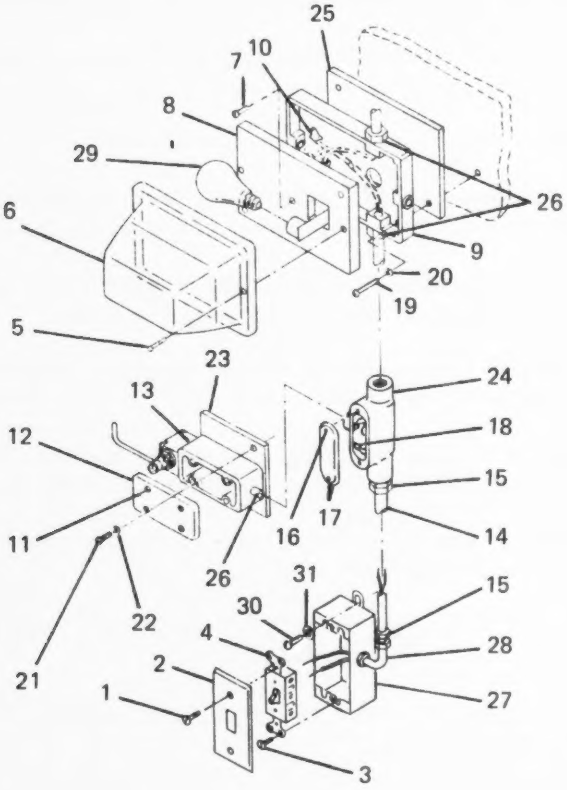
14. Remove two screws (21) and lockwashers (22) from limit switch mounting plate (23).

15. Separate limit switch (13) from outlet conduit (24) by unscrewing nipple (26).

16. Separate outlet conduit (24) from light fixture adapter (9) by unscrewing nipple (26).

17. Remove two screws (19) and lockwashers (20) from light fixture adapter (9) and incandescent light spacer (25).

18. Separate light fixture adapter (9) from conduit above by unscrewing nipple (26).



4-10. (cont)

CLEANING, INSPECTION

1. Wipe incandescent light assembly and component surfaces.
2. Inspect mounting surfaces for corrosion and damage.
3. Inspect for and replace if necessary:
   a. Missing or damaged components.
   b. Corrosion or paint damage.

REPAIR

Corrosion or paint damage. (Refer to 4-37.)

INSTALLATION

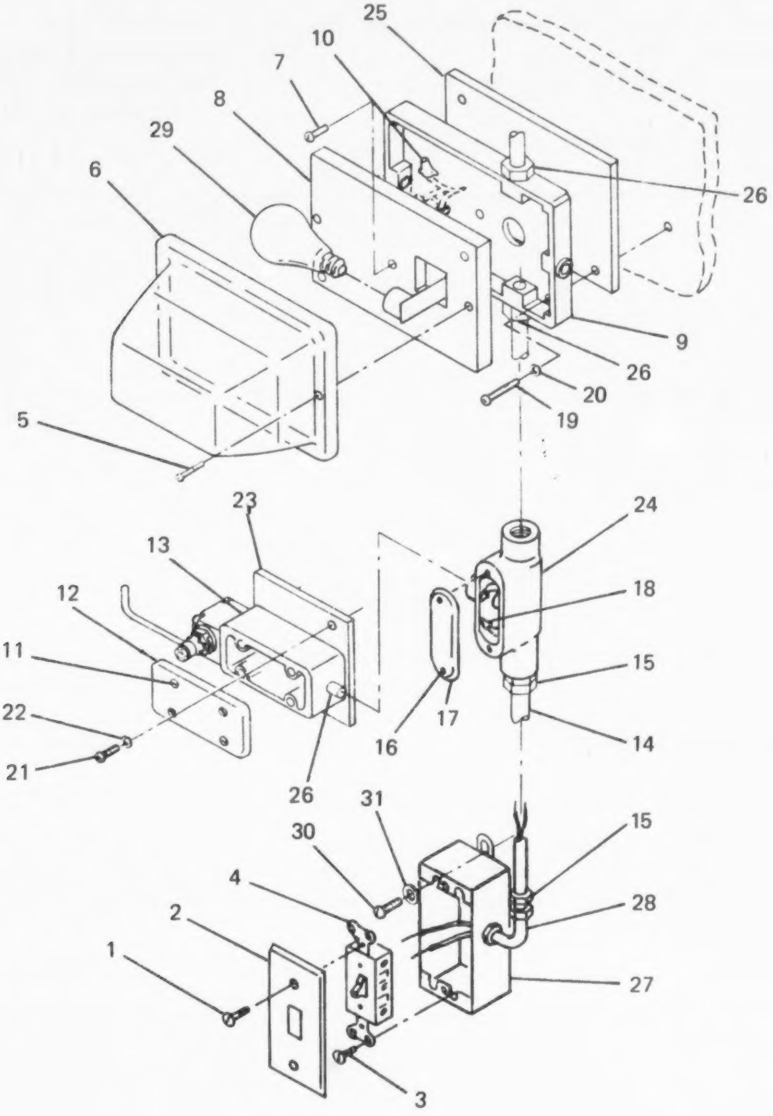
1. Assemble light fixture adapter (9) to conduit above with nipple (26).
2. Assemble light fixture adapter (9) and incandescent light spacer (25) to endwall with two screws (19) and lockwashers (20).
3. Assemble outlet conduit (24) to light fixture adapter (9) with nipple (26).
4. Assemble limit switch (13) to outlet conduit (24) with nipple (26).
5. Assemble limit switch (13) with limit switch mounting plate (23) to endwall with two screws (21) and lockwashers (22).
6. Pass wires through upper conduit and nipple (26) into light fixture adapter (9) and connect wires. (Refer to 4-40.)
7. Assemble conduit (14) between outlet conduit (24) and elbow connector (28) with two connectors (15).
8. Pass wires from outlet box (27) and limit switch (13) into outlet conduit (24) and connect wires. (Refer to 4-40.)
9. Connect wires in outlet box (27) to switch (4) and assemble switch to outlet box with two screws (3).
10. Assemble gasket (18) and cover (17) to outlet conduit (24) by tightening two captive screws (16).
11. Assemble limit switch cover (12) to limit switch (13) by tightening four captive screws (11).

4-10. (cont)

12. Assemble switch cover (2) to outlet box (27) with two screws (1).

13. Assemble light fixture (8) to light fixture adapter (9) with screw (7). Insert bulb (29).

14. Assemble light fixture cover (6) to light fixture (8) with two screws (5).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4-11. CEILING LIGHT

This task covers:

- a. Testing
- b. Removal
- c. Disassembly
- d. Cleaning, Inspection
- e. Repair
- f. Assembly
- g. Installation

INITIAL SETUP

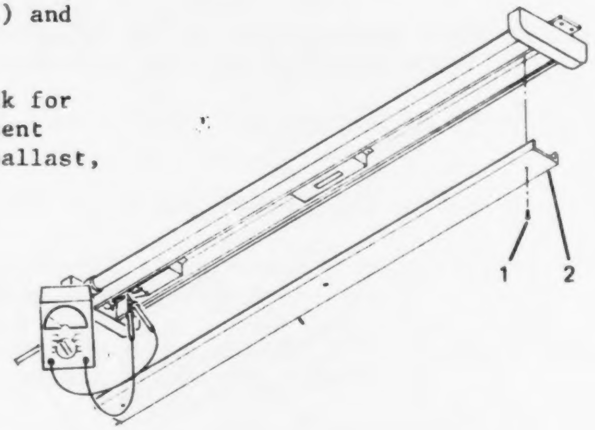
Special Tools
Hand blind riveter, Appendix B, Item 2
Test Equipment
Multimeter, Appendix B, Item 4
Standard Tools
General mechanics tool kit
Electrical tool kit

Personnel
Electrician
Equipment Condition
All circuit breakers and switches in OFF position

TESTING

1. Remove three screws (1) and cover (2).

2. Using multimeter, check for continuity of fluorescent lamps, light filter, ballast, and wiring.



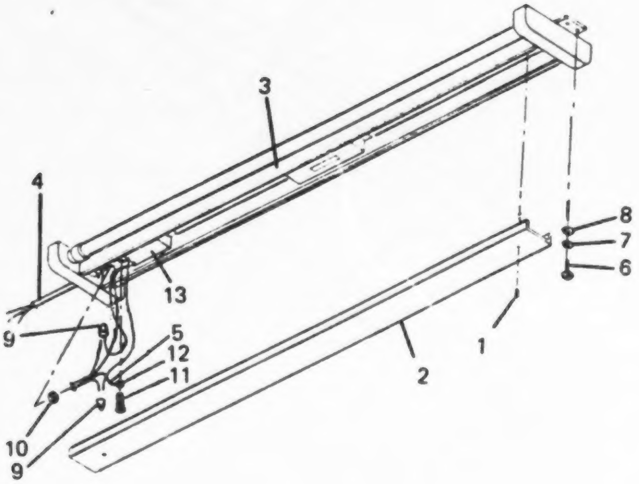
WARNING

This fixture contains voltage that is dangerous if contacted. Before replacing fixed roof area ceiling light, set all circuit breakers and switches to OFF position.

3. If no continuity is present, replace defective fluorescent lamp, light filter, ballast, or wiring.

4-11. (cont)

REMOVAL



1. Remove three screws (1) and cover (2) from ceiling light (3).

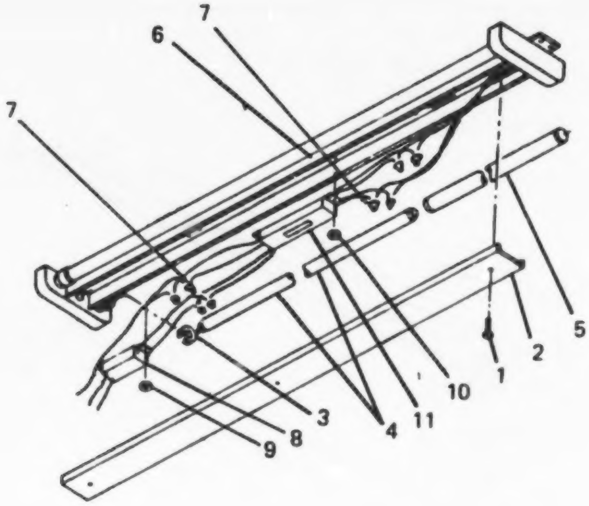
NOTE

Tag wires for reconnection.

2. Remove wire nuts (9) and disconnect wires from light filter (13) in ceiling light (3).
3. Loosen locknut (10) and separate conduit (4) from ceiling light (3).
4. Remove installation screw (11) attaching terminal lug (12) on third wire (5) from conduit (4).
5. Remove four screws (6), lockwashers (7), and washers (8), and remove ceiling light (3) from roof assembly.

4-11. (cont)

DISASSEMBLY



WARNING

In the event of lamp breakage, care must be taken in the removal of broken glass fragments and white phosphorus dust that may be dispersed within the fixture. Inhalation of phosphorus dust could cause dangerous injury.

1. Remove screws (1) and cover (2) from light frame (6).

CAUTION

When removing end caps, hold safety tube level to prevent fluorescent tube from accidentally sliding out and dropping.

2. Remove split retaining rings (3) from one end of fluorescent lamps (4).
3. Remove two fluorescent lamps (4) with light shields (5) by rotating and sliding out of light frame (6). Remove light shields (5) from fluorescent lamps (4).
4. Remove two wire nuts (7) and separate two sets of wires between light filter (8) and ballast (11).
5. Remove two wire nuts (7) and separate two sets of wires between ballast (11) and contacts on light frame (6).

4-11. (cont)

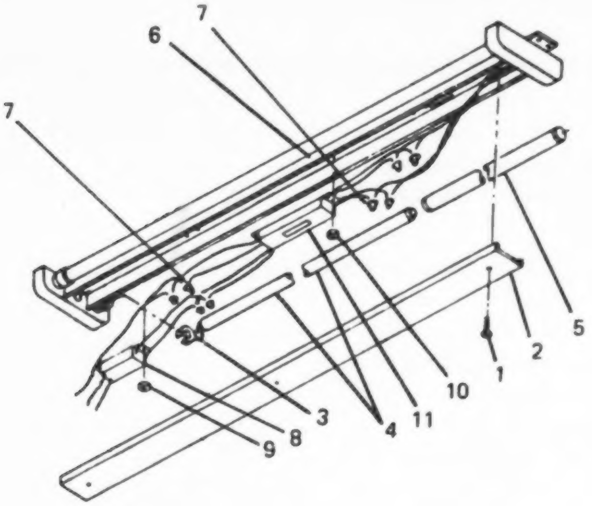
NOTE

Tag all wires for reconnection

6. Remove four wire nuts (7) and separate four sets of wires between ballast (11) and contacts at opposite end of light frame (6).

7. Remove nuts (9) and remove light filter (8) from light frame (6).

8. Remove nuts (10) and remove ballast (11) from light frame (6).



CLEANING, INSPECTION

1. Wipe ceiling light and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:
    a. Missing or damaged components.
    b. Corrosion or paint damage.

4-11. (cont)

REPAIR

Repair corrosion or paint damage. (Refer to 4-37.)

ASSEMBLY

1. Position ballast (11) in light frame (6) and secure with nuts (10).
2. Position light filter (8) in light frame (6) and secure with nuts (9).
3. Connect two wires from light filter (8) to two wires from ballast (11) as follows:

   Black to Black
   Yellow to White

4. Connect two wires from ballast (11) to contacts on light frame (6) as follows:

   Yellow to Yellow
   Yellow to Black

5. Connect four wires from ballast (11) to contacts at opposite end of light frame (6) as follows:

   Red to Black
   Red to Black
   Blue to White
   Blue to White

6. Secure all wires with wire nuts (7).
7. Assemble light shields (5) on fluorescent lamps (4) and install in light frame (6) by sliding in and rotating.
8. Install split retaining rings (3).
9. Attach cover (2) to light frame (6) with screws (1).

4-11. (cont)

INSTALLATION

1. Position ceiling light (3) against roof assembly and install washers (8), lockwashers (7), and screws (6).

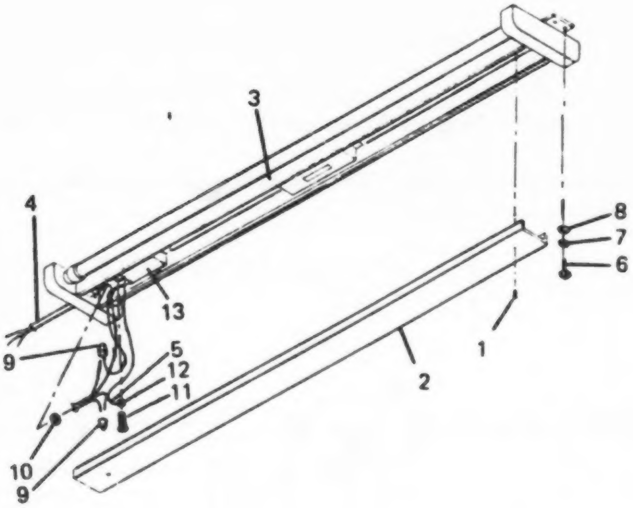
2. Pull wires from conduit (4) into ceiling light (3) and connect two wires to two wires from light filter (13) as follows:

   Black to Black
   White to Yellow/Green

3. Attach terminal lug (12) on end of green wire to ceiling light (3) with installation screw (11).

4. Attach conduit (4) to ceiling light (3) with locknut (10).

5. Attach cover (2) to ceiling light (3) with screws (1).



4-12. RECEPTACLE OUTLETS

This task covers:

- a. Testing
- b. Removal
- c. Disassembly
- d. Cleaning, Inspection
- e. Repair
- f. Assembly
- g. Installation

INITIAL SETUP

Standard Tools
  General mechanics tool kit
  Electrical tool kit

Test Equipment
  Multimeter, Appendix B, Item 4

Personnel
  Electrician
  Sheet metal worker

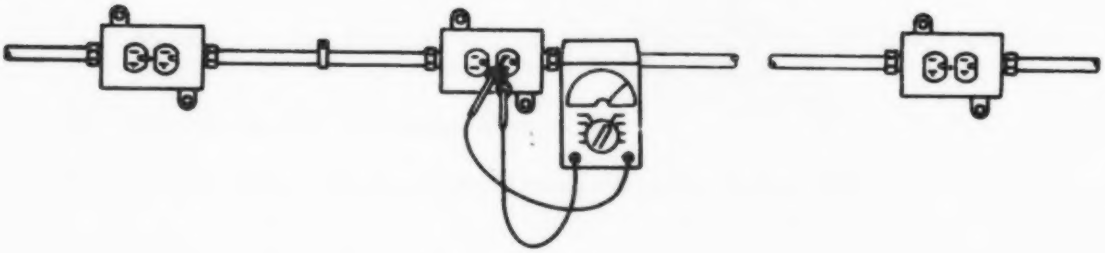
WARNING

Remove all electrical power from circuits before removing cable and receptacle assemblies.

TESTING

1. Set all circuit breakers to OFF position.

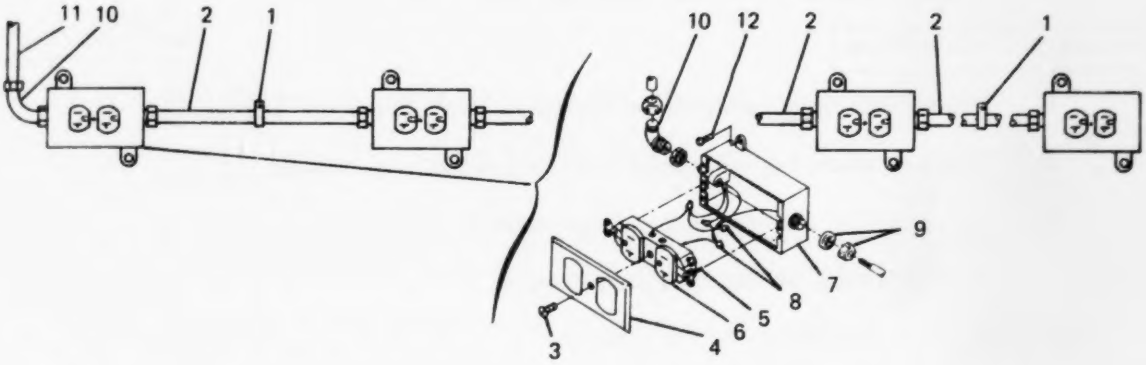
2. Using multimeter, check for continuity in cable, conduit, and receptacle assemblies.



4-12. (cont)

REMOVAL

1. Open straps (1) securing conduit (2) to fixed sidewall.
2. Remove screws (3) and duplex receptacle covers (4).
3. Loosen captive screws (5) and move duplex receptacles (6) away from outlet boxes (7) as far as they will go.



NOTE
Tag wires for reconnection.

4. Remove wire nuts (8) and disconnect wires from rear of duplex receptacles (6).
5. Disconnect connectors (9 and 10) and separate conduit (2 and 11) from outlet boxes (7).
6. Remove screws (12) and outlet boxes (7) from fixed sidewall.

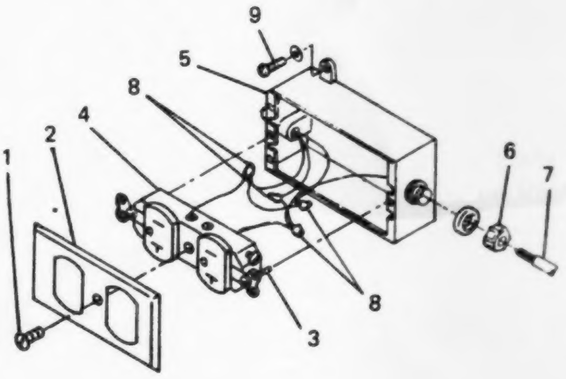
DISASSEMBLY

1. Remove screws (1) and duplex covers (2).
2. Loosen captive screws (3) and move duplex receptacles (4) away from junction boxes (5) as far as they will go.

NOTE

Tag wires for reconnection

3. Remove wire nuts (8) and terminals, and disconnect wires from rear of receptacles (4), where applicable.



4-12. (cont)

NOTE

Tag wires for reconnection

4. Remove liquid tight connectors (6) from junction boxes (5) and separate connectors from electrical cords (7).

5. Remove screws (9) from junction boxes (5).

CLEANING, INSPECTION

1. Wipe cable and receptacle assembly and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components.

   b. Corrosion or paint damage.

REPAIR

1. Repair or replace damaged wiring.

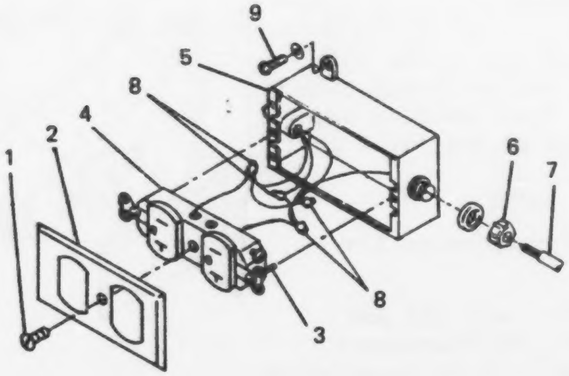
2. Corrosion or paint damage. (Refer to 4-37.)

ASSEMBLY

1. Install screws (9) in junction boxes (5).

2. Assemble liquid tight connectors (6) on electrical cords (7).

3. Install liquid tight connectors (6) in junction boxes (5).

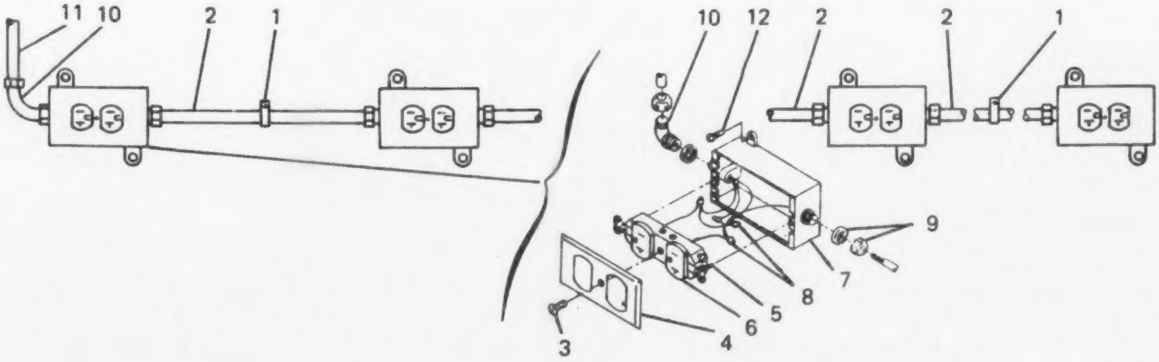


4-12. (cont)

4. Connect wires to receptacles (4) and attach wire nuts (8) and terminals, where applicable. (Refer to 4-40.)
5. Position receptacles (4) on junction boxes (5) and install screws (3).
6. Position covers (2) on duplex receptacles (4) and install screws (1).

INSTALLATION

1. Install outlet boxes (7) on fixed sidewall with screws (12).
2. Install conduit (2 and 11) in outlet boxes (7) with connectors (9 and 10).
3. Position duplex receptacles (6) near outlet boxes (7), connect wires, and secure with wire nuts (8). (Refer to 4-40).
4. Position duplex receptacles (6) on outlet boxes (7) and tighten captive screws (5).
5. Position duplex receptacle covers (4) on outlet boxes (7) and install screws (3).
6. Secure conduit (2) to fixed sidewall with straps (1).



4-13. WALL SWITCH

This task covers:
- a. Removal
- b. Installation

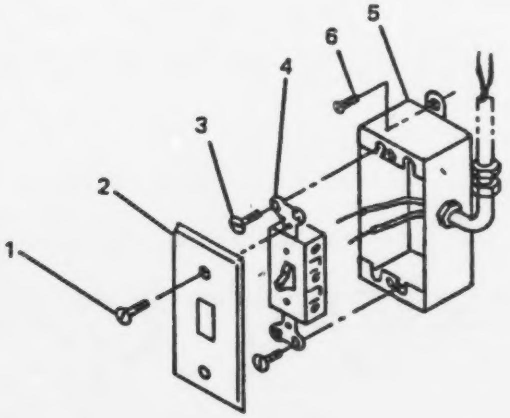
INITIAL SETUP

Standard Tools
General mechanics tool kit
Electrical tool kit

Personnel
Electrician

REMOVAL

1. Set all circuit breakers and switches to OFF position.
2. Remove two screws (1) and switch cover (2).
3. Remove two screws (3) and carefully pull wall switch (4) out of switch box (5) as far as it will go.
4. Disconnect wires from wall switch (4).
5. Remove two screws (6) and remove switch box (5) from wall.



INSTALLATION

1. Position switch box (5) on wall and secure with screws (6).
2. Position wall switch (4) near switch box (5) and connect wires to rear of switch. (Refer to 4-40.)
3. Position wall switch (4) in switch box (5) and secure with two screws (3).
4. Position switch cover (2) against switch box (5) and secure with two screws (1).

4-14. BLACKOUT SWITCH

This task covers.

- a. Removal
- b. Cleaning, Inspection
- c. Repair
- d. Installation
- e. Adjustment

INITIAL SETUP

Standard Tools
General mechanics tool kit
Electrical tool kit

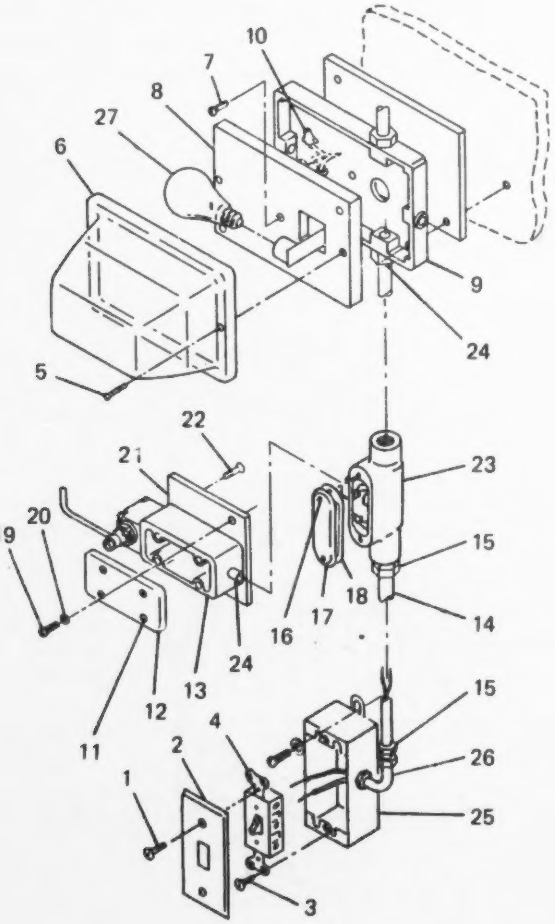
Personnel
Electrician

Materials
Contact cleaner Item 26, Appendix E

REMOVAL

1. Remove two screws (1) and switch cover (2).

2. Remove two screws (3) and pull switch (4) from outlet box (25) as far as it will go.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4-14. (cont)

NOTE

Tag wires for reconnection.

3. Disconnect wires at rear of switch (4).
4. Remove two screws (5) and light fixture cover (6). Remove bulb (27).
5. Remove screw (7) and separate light fixture (8) from light fixture adapter (9) as far as it will go.

NOTE

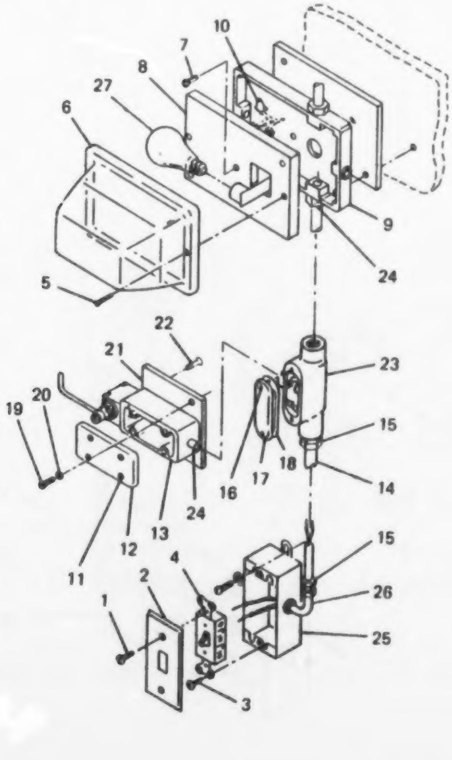
Tag wires for reconnection.

6. Remove wire nuts (10) and disconnect wires from rear of light fixture (8).
7. Loosen four captive screws (11) and remove limit switch cover (12).

NOTE

Tag wires for reconnection.

8. Disconnect three sets of wires plus one ground wire inside limit switch (13).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4-14. (cont)

9. Loosen two captive screws (16) and remove cover (17) and gasket (18) from outlet conduit (23).

10. Disconnect wires in outlet conduit (23).

11. Pull wires up through conduit (14) and into light fixture adapter (9).

12. Loosen two connectors (15) between outlet conduit (23) and elbow connector (26), and remove conduit (14).

13. Remove two screws (19) and lockwashers (20) from limit switch mounting plate (21).

14. Separate limit switch (13) from outlet conduit (23) by unscrewing nipple (24).

15. Separate outlet conduit (24) from light fixture adapter (9) by unscrewing nipple (26).

16. Remove two screws (22) and separate limit switch (13) from limit switch mounting plate (21).

CLEANING, INSPECTION

1. Clean blackout switch and component surfaces with contact cleaner.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components.

   b. Corrosion or paint damage.

REPAIR

Corrosion or paint damage. (Refer to 4-37.)

INSTALLATION

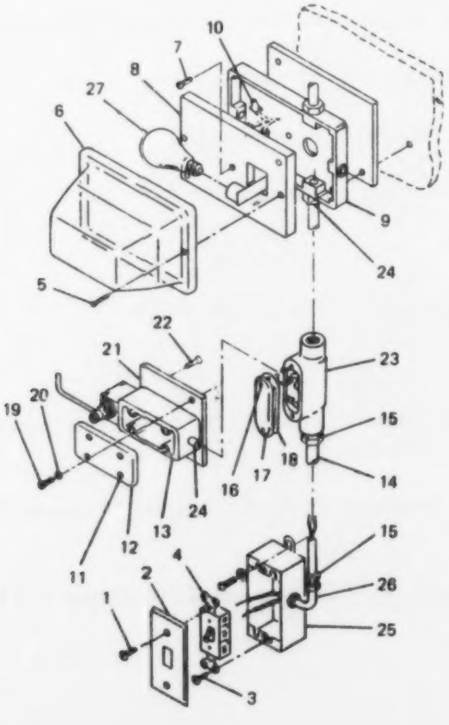
1. Assemble limit switch (13) to limit switch mounting bracket (21) with two screws (22).

2. Assemble outlet conduit (23) to light fixture adapter (9) with nipple (24).

3. Assemble limit switch (13) to outlet conduit (23) with nipple (24).

4-14. (cont)

4. Assemble limit switch (13) to endwall with two screws (19) and lockwashers (20).
5. Pass wires through upper conduit and nipple (24) into light fixture adapter (9) and connect wires. (Refer to 4-40.)
6. Assemble conduit (14) between outlet conduit (23) and elbow connector (26) with two connectors (15).
7. Pass wires from outlet box (25) and limit switch (13) into outlet conduit (23) and connect wires. (Refer to 4-40.)
8. Connect wires in outlet box (25) to switch (4) and assemble switch to outlet box with two screws (3).
9. Assemble gasket (18) and cover (17) to outlet conduit (23) by tightening two captive screws (16).
10. Assemble limit switch cover (12) to limit switch (13) by tightening four captive screws (11).
11. Assemble switch cover (2) to outlet box (25) with two screws (1).
12. Assemble light fixture (8) to light fixture adapter (9) with screw (7). Insert bulb (27).
13. Assemble light fixture cover (6) to light fixture (8) with two screws (5).

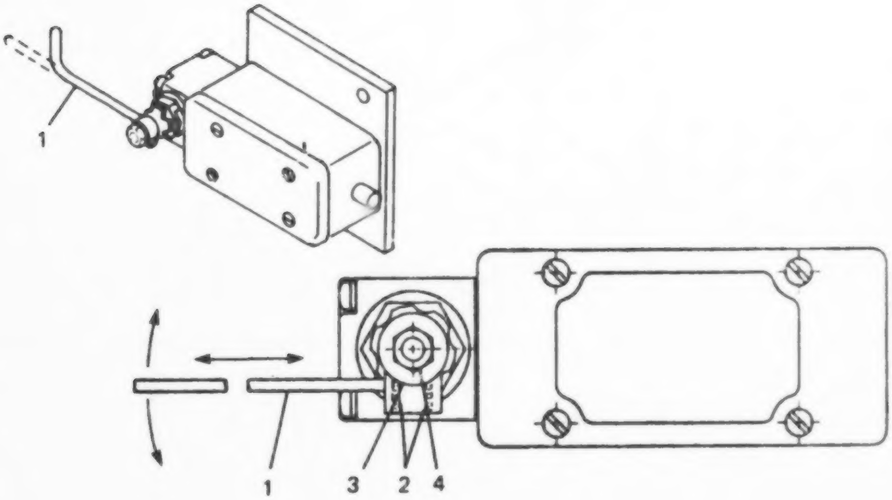


4-14. (cont)

ADJUSTMENT

There are three possible adjustments which can be made on the blackout switch.

1. Bend limit switch arm (1) towards or away from the endwall panel.
2. Loosen two setscrews (2) and slide limit switch arm (1) in or out of collar (3).
3. Loosen nut (4) and rotate collar (3) with limit switch arm (1) up or down.



4-15. FAN ASSEMBLY

This task covers:

- a. Testing
- b. Removal
- c. Installation

INITIAL SETUP

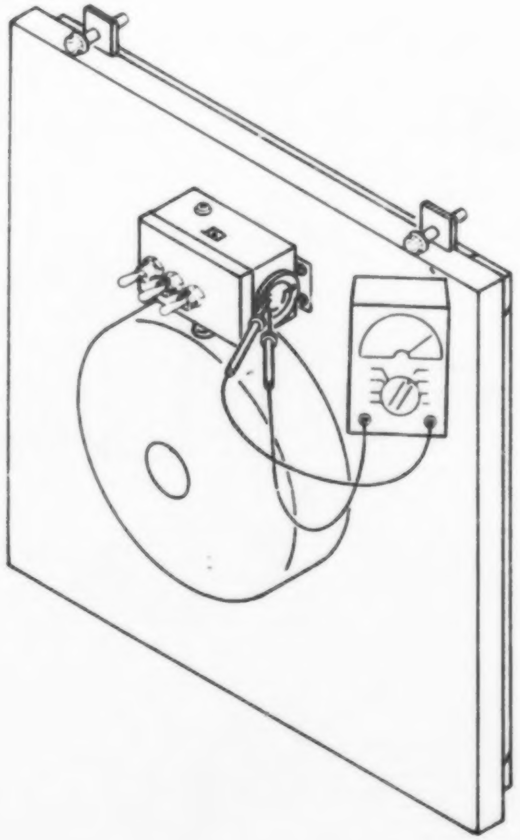
Standard Tools
General mechanics tool kit

Test Equipment
Multimeter, Appendix B, Item 4

Personnel
Electrician

TESTING

1. Using multimeter, check fan assembly for continuity.
2. If no continuity is present, replace defective fan assembly or wiring.

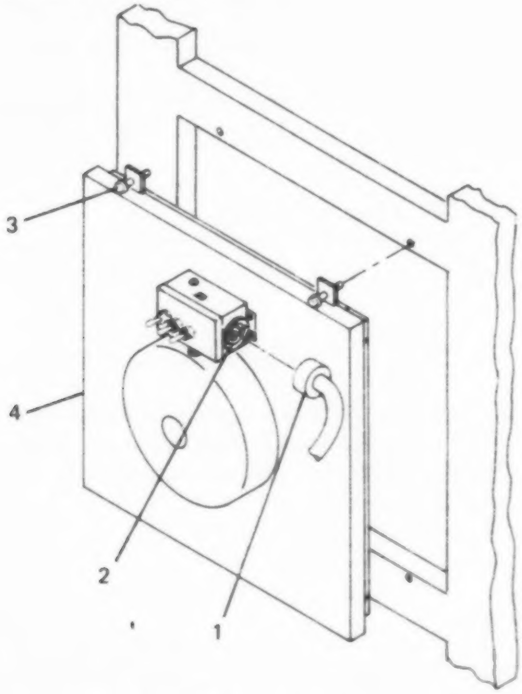


4-15. (cont)

REMOVAL

1. Disconnect electrical cord (1) from receptacle (2).

2. Loosen four captive screws (3) and remove fan and panel assembly (4) from rear personnel end panel.



INSTALLATION

1. Position fan and panel assembly (4) in rear personnel end panel and secure by tightening four captive screws (3).

2. Connect electrical cord (1) in receptacle (2).

4-16. WIRING

This task covers:

a. Testing
b. Removal
c. Disassembly
d. Cleaning, Inspection
e. Repair
f. Assembly
g. Installation

INITIAL SETUP

Standard Tools
General mechanics tool kit
Electrical tool kit

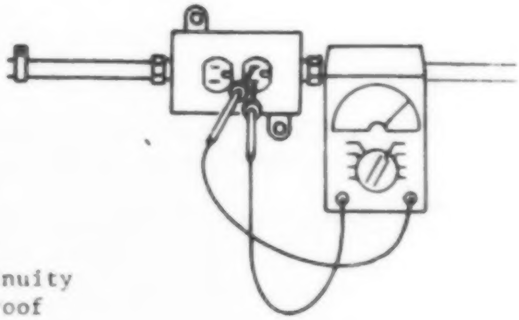
Test Equipment
Multimeter, Appendix B, Item 4

Personnel - 2
Electrician

WARNING

Wiring contains voltage that is dangerous if contacted. Before replacing wiring, make sure all circuit breakers and switches are set to OFF position.

TESTING



1. Set all circuit breakers and switches to OFF position.
2. Using multimeter, check for continuity at outlet receptacles mounted on sidewalls.
3. Using multimeter, check for continuity at fluorescent light fixture on roof assembly.
4. If no continuity is present, replace defective outlet receptacle, fluorescent light fixture, or wiring.

4-16. (cont)

REMOVAL

1. Open circuit breaker panel door (1).

2. Loosen four captive screws (2) and move four clamp fingers (3) to OPEN position.

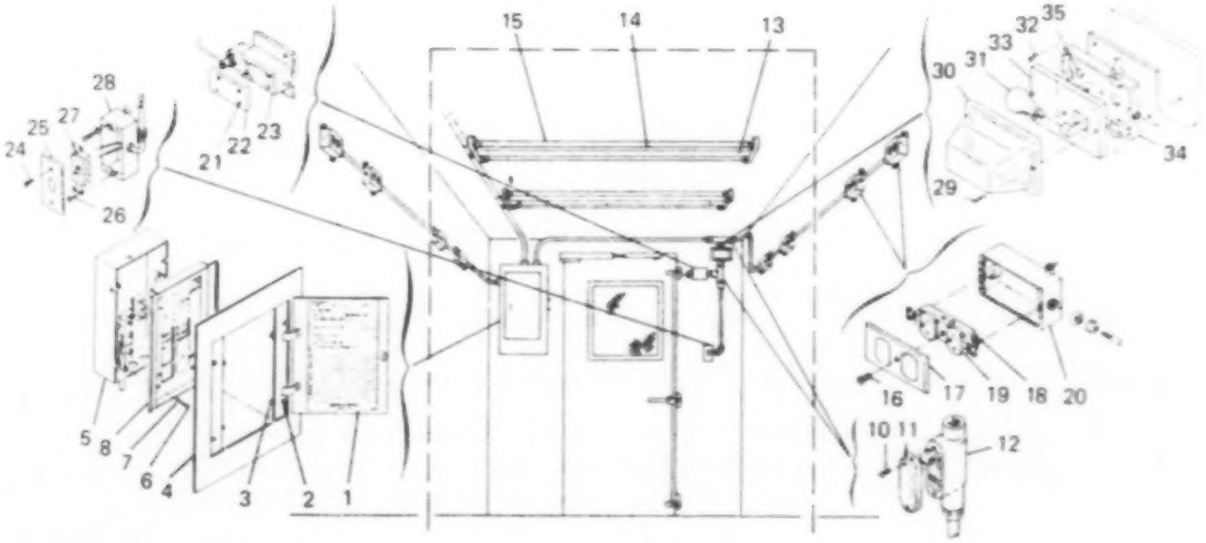
3. Lift circuit breaker panel cover (4) from circuit breaker box (5).

4. Remove four screws (6) and washers (7) and lift panelboard (8) from circuit breaker box (5).

NOTE

Tag wires for reconnection.

5. Disconnect wires in circuit breaker box (5).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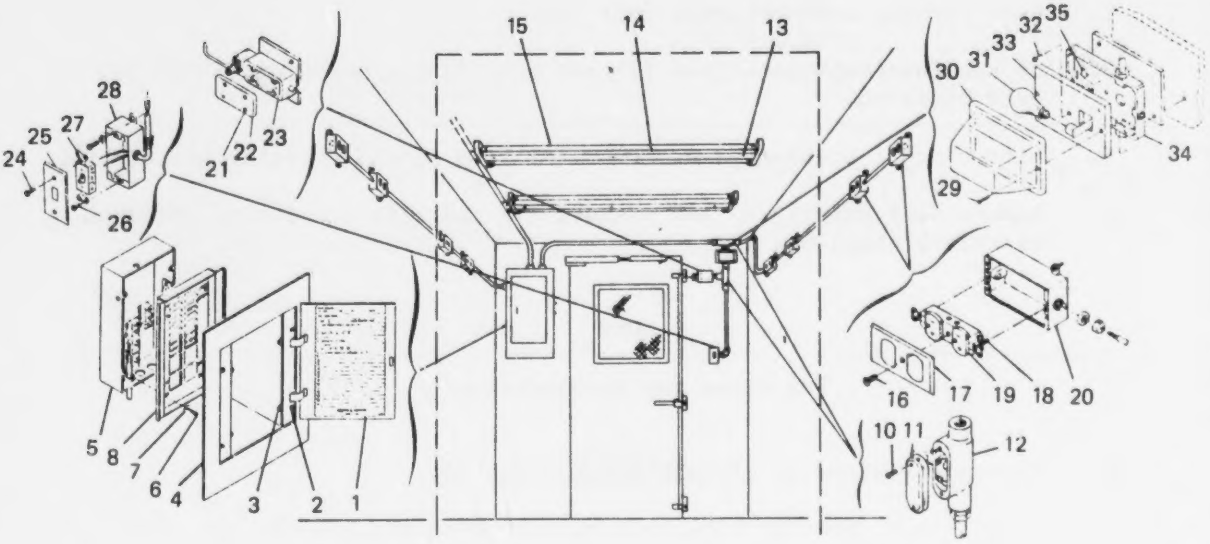
6. Loosen two captive screws (10) and remove conduit outlet cover (11) from conduit outlet body (12).

NOTE

Tag wires for reconnection.

7. Disconnect wires in conduit outlet body (12).

4-16. (cont)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8. Remove nine screws (13) and three ceiling light covers (14).

NOTE

Tag wires for reconnection.

9. Disconnect wires in each of three ceiling lights (15).

10. Remove screws (16) and receptacle covers (17).

11. Loosen captive screws (18) and remove receptacles (19) from outlet boxes (20) as far as they will go.

NOTE

Tag wires for reconnection.

12. Disconnect wires at rear of receptacles (19).

13. Loosen four captive screws (21) and remove limit switch cover (22) from limit switch (23).

14. Disconnect wires in limit switch (23).

4-16. (cont)

NOTE

Tag wires for reconnection.

15. Remove two screws (24) and remove switch cover (25).

16. Remove two screws (26) and remove switch (27) from outlet box (28) as far as it will go.

NOTE

Tag wires for reconnection.

17. Disconnect wires from switch (27).

18. Remove two screws (29) and light fixture cover (30). Remove bulb (31).

19. Remove screw (32) and separate light fixture (33) from light fixture adapter (34) as far as it will go.

NOTE

Tag wires for reconnection.

20. Remove wire nuts (35) and disconnect wires from light fixture (38).

21. Remove wires from electrical conduits.

INSTALLATION

1. Pull wires through electrical conduits.

2. Connect wires to light fixture (33) and attach wire nuts (35). (Refer to 4-40).

3. Assemble light fixture (33) to light fixture adapter (34) with screw (32).

4. Install bulb (31). Assemble light fixture cover (30) to light fixture (33) with two screws (29).

5. Connect wires to switch (27). (Refer to 4-40.)

6. Install switch (27) in outlet box (28) and secure with two screws (26).

7. Assemble switch cover (25) to outlet box (28) with two screws (26).

8. Connect wires to limit switch (23). (Refer to 4-40.)

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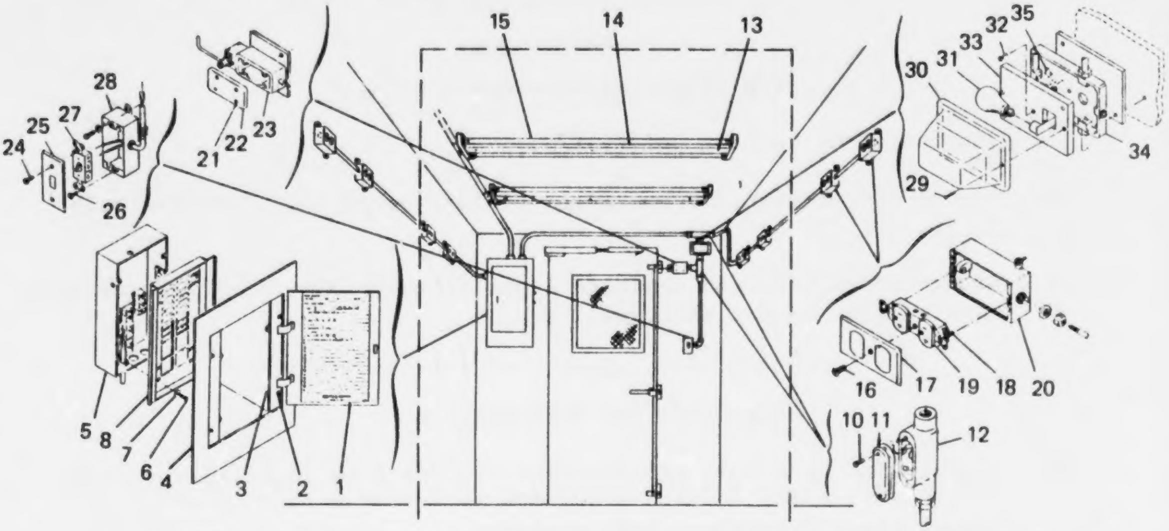
4-16. (cont)

9. Assemble limit switch cover (22) to limit switch (23) by tightening four captive screws (21).

10. Connect wires to rear of receptacles (19). (Refer to 4-40.)

11. Install receptacles (19) in outlet boxes (20) and tighten two captive screws (18).



12. Attach duplex receptacle covers (17) to outlet boxes (20) with screws (16).

13. Connect wires to each of three ceiling lights (15). (Refer to 4-40.)

14. Attach three ceiling light covers (14) to three ceiling lights (15) with nine screws (13).

15. Connect wires to conduit outlet body (12). (Refer to 4-40.)

16. Attach conduit outlet cover (11) to conduit outlet body (12) by tightening two captive screws (10).

17. Connect wires to circuit breaker box (5). (Refer to 4-40.)

18. Position panelboard (8) over circuit breakers in circuit breaker box (5) and secure with four screws (6) and washers (7).

19. Position circuit breaker panel cover (4) against circuit breaker box (5) and secure by moving four clamp fingers (3) to LOCK position and tightening four captive screws (2).

20. Close circuit breaker panel door (1).

4-17. PERSONNEL DOOR

This task covers:

- a. Removal
- b. Disassembly
- c. Cleaning, Inspection
- d. Repair
- e. Assembly
- f. Installation
- g. Alignment

INITIAL SETUP

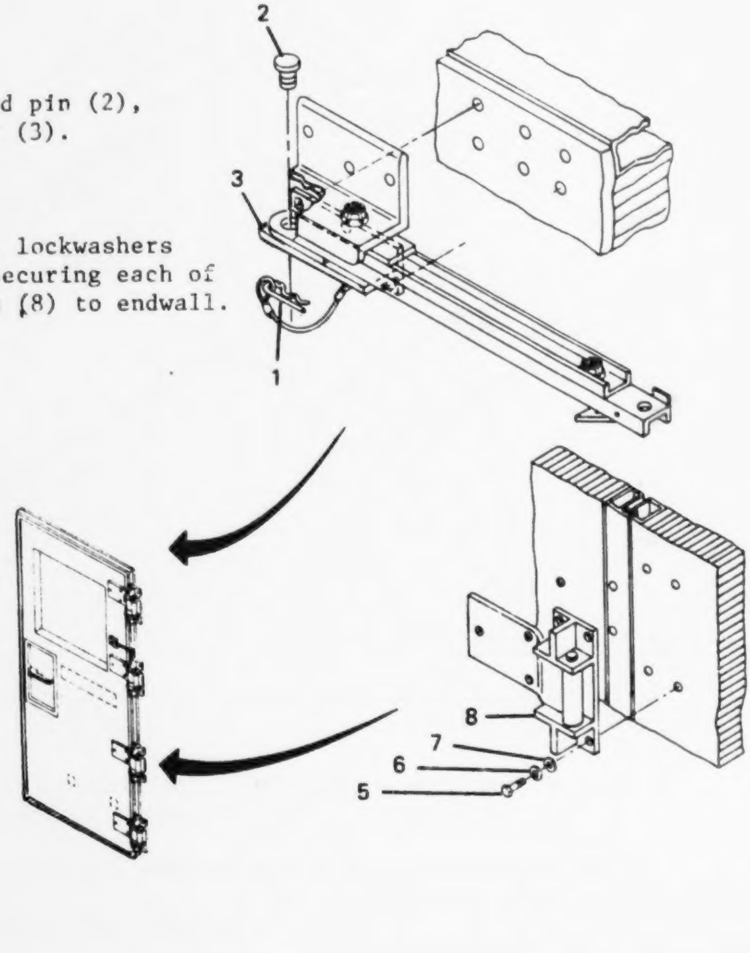
Special tools
Hand blind riveter, Appendix B, Item 2
Personnel - 2

Materials
Sealing compound, Item 19, Appendix E
Standard tools
General mechanics tool kit

REMOVAL

Personnel Door

1. Remove hairpin (1), and pin (2), and swing back bracket (3).
2. Close door (4).
3. Remove four bolts (5), lockwashers (6), and washers (7) securing each of four hinge base plates (8) to endwall.



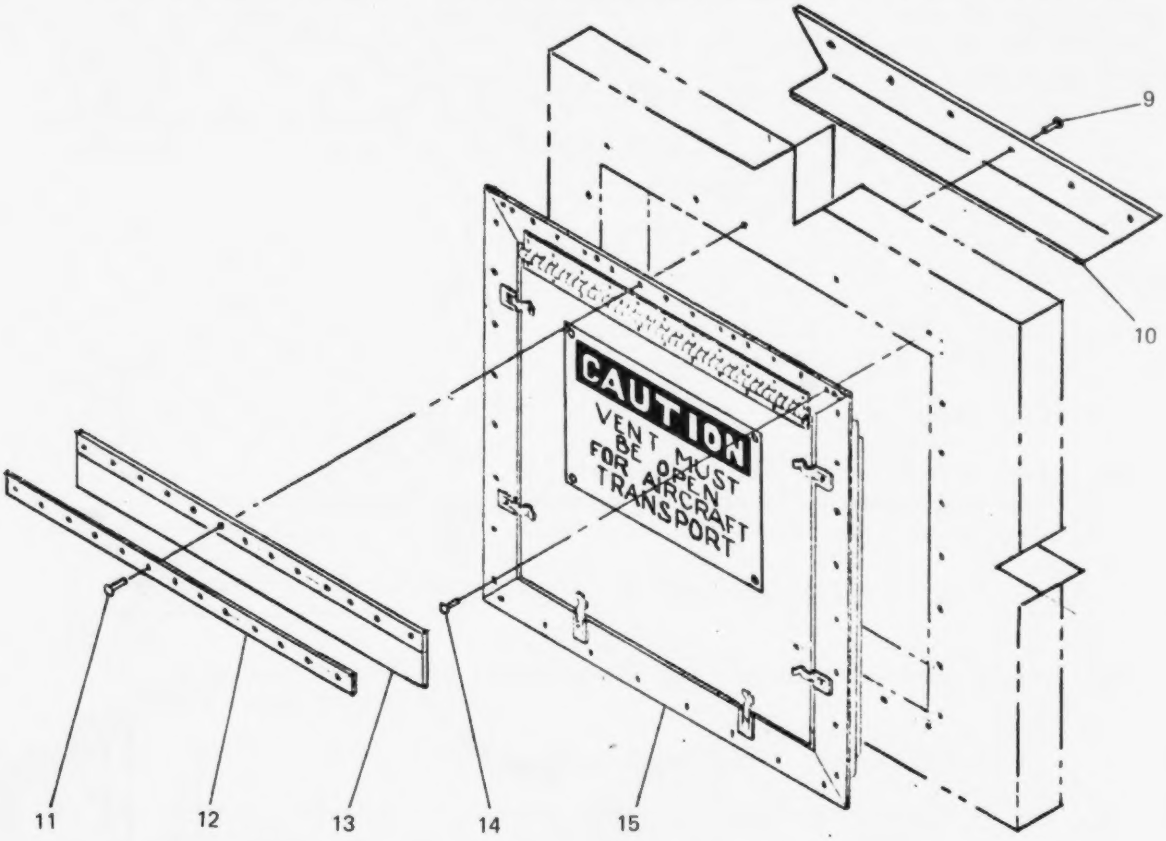
4-17. (cont)

Door Vent

4. Drill out rivets (9) and remove four vent retainer strips (10). (Refer to 4-26.)

5. Drill out rivets (11) and remove retainer strip (12) and rain strip (13). (Refer to 4-26.)

6. Drill out rivets (14) and remove door vent (15). (Refer to 4-26.)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CAUTION
VENT MUST BE OPEN FOR AIRCRAFT TRANSPORT
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Door Lock Assembly

7. Remove three retaining rings (16), four flanged bearings (17), and top rod (18).

8. Remove four screws (32), four bolts (33), lockwashers (34), washers (35), mounting plates (36 and 37), and screw (38).

9. Remove nuts (19), washers (20 and 21), latch arms (22), spacers (23), and pins (24).

4-17. (cont)

10. Drive out dowel pins (25 and 26) and remove inside handle (27), latch arm (28), washer (29), pin (30) and bottom rod (31).

11. Repeat steps 7 through 10 to remove lower latch arm.

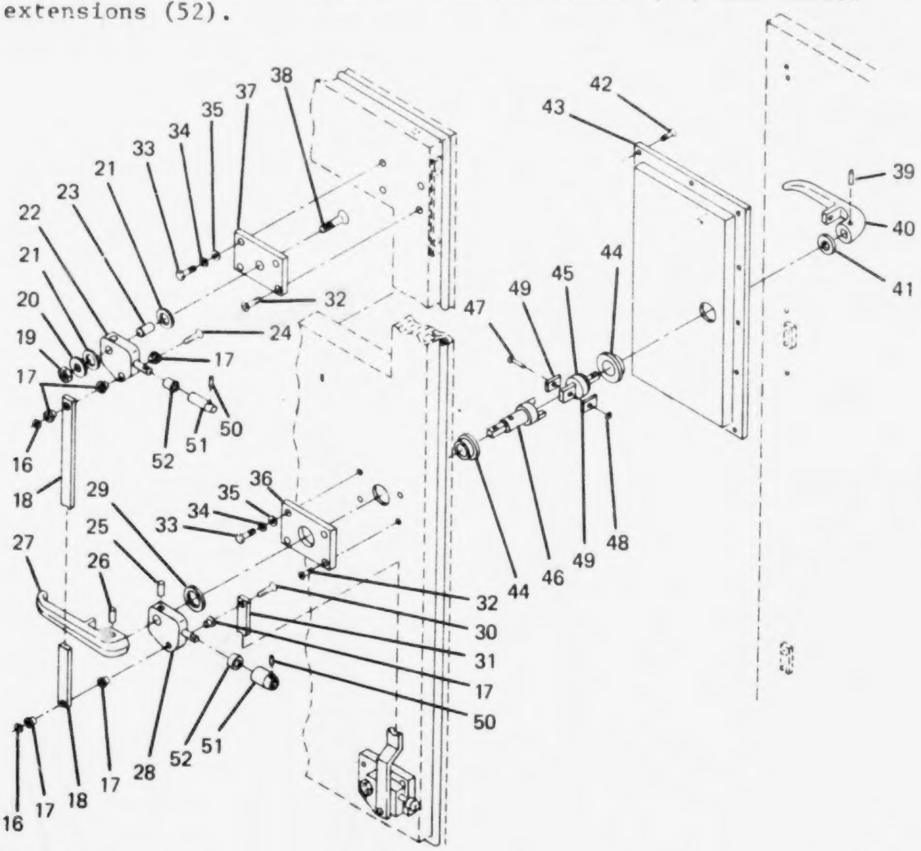
12. Drive out dowel pin (39) and remove outside handle (40) and washers (41).

13. Drill out rivets (42) and remove pan (43). (Refer to 4-26).

14. Remove flanged bearings (44) and shafts (45 and 46).

15. Drill out rivet (47) and remove washer (48) and spacers (49).

16. Drive out dowel pins (50) and remove rollers (51) and roller extensions (52).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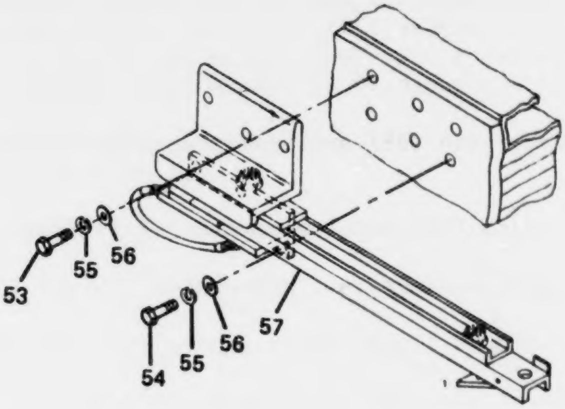
Door Stop Assembly

17. Remove six bolts (53 and 54), lockwashers (55), and washers (56).

18. Remove door stop assembly (57) from door.

4-17. (cont)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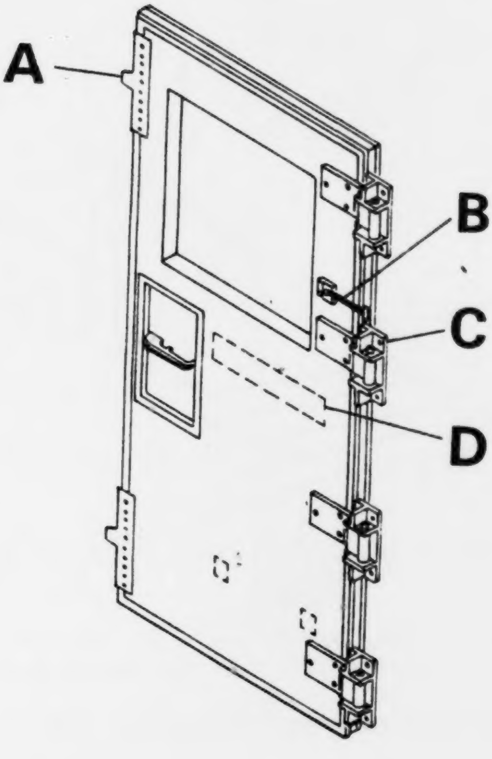
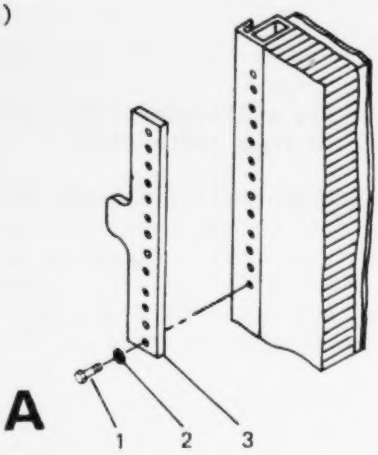
DISASSEMBLY

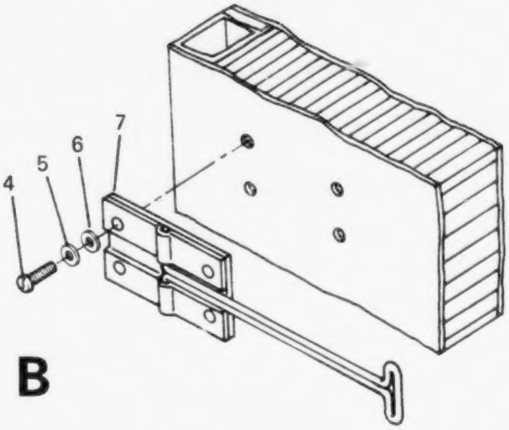
Personnel Door



4-17. (cont)



1. Remove screws (1) and lockwashers (2) securing personnel door shear plate (3) to door.

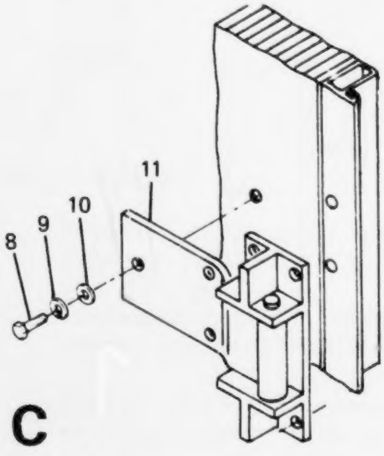


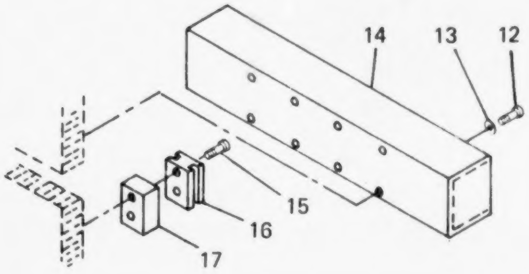
2. Remove screws (4), lockwashers (5), and washers (6) securing door holder (7) to door.

3. Remove bolts (8), lockwashers (9), and washers (10) securing hinge (11) to door.

4. Remove screws (12) and lockwashers (13) securing jack storage bracket (14) to door.

5. Remove screws (15) securing jack support bracket (16) and spacer (17) to door.





4-17. (cont)

Door Vent

6. Remove screws (18), lockwashers (19), and washers (20) securing filter frame (21) and filter (22) to vent frame (23).

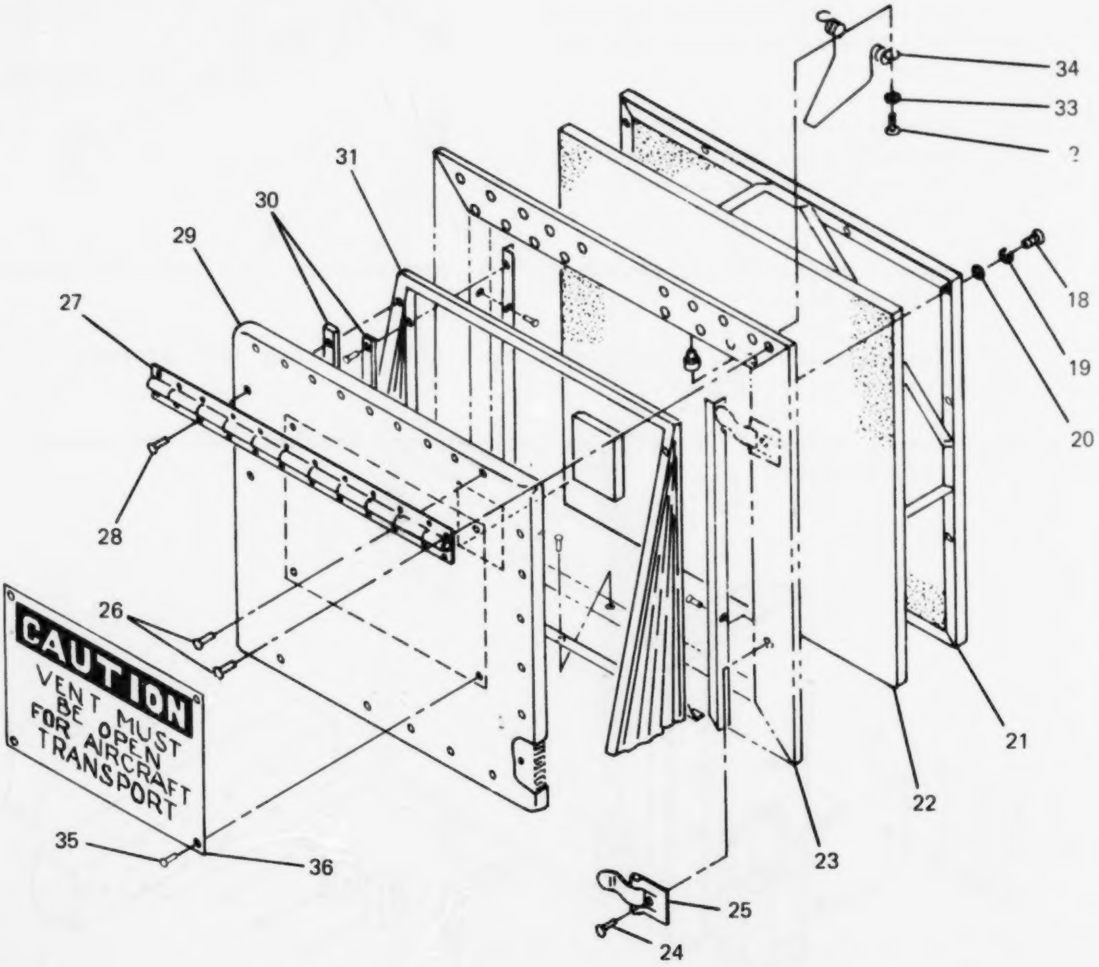
7. Drill out rivet (24) and remove fastener (25). (Refer to 4-26.)

8. Drill out rivets (26) and remove hinge (27). (Refer to 4-26.)

9. Drill out rivets (28) and remove door vent (29), retainer strips (30), and curtain (31). (Refer to 4-26).

10. Remove bolts (32), washers (33), and spring (34).

11. Drill out rivets (35) and remove caution plate (36).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CAUTION
VENT MUST BE OPEN FOR AIRCRAFT TRANSPORT
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4-17. (cont)

Door Stop Assembly

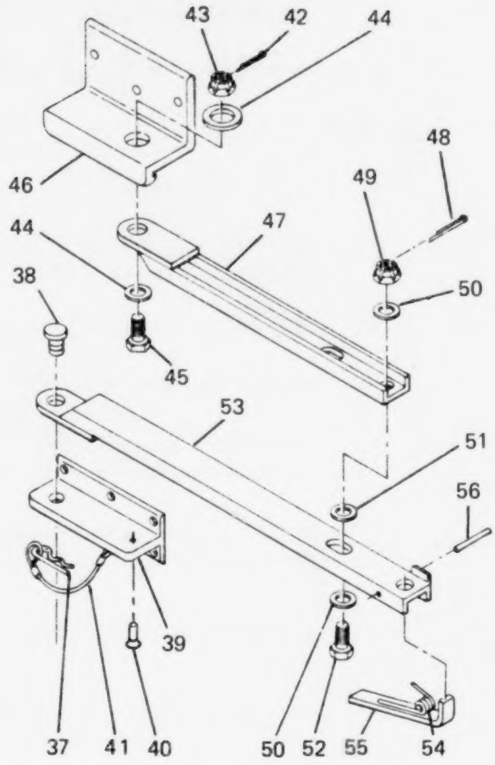
12. Remove hair pin (37), pin (38), and bracket (39).

13. Drill out rivet (40) to remove lanyard (41). (Refer to 4-26.)

14. Remove cotter pin (42), nut (43), washers (44), and bolt (45) securing bracket (46) to upper brace (47).

15. Remove cotter pin (48), nut (49), washers (50), nylon washer (51), and bolt (52) securing upper brace (47) to lower brace (53).

16. Compress spring (54) with catch (55) and drive out roll pin (56).



CLEANING, INSPECTION

1. Wipe panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components

   b. Corrosion or paint damage.

REPAIR

1. Panel skin damage. (Refer to 4-25 through 4-36.)

2. Corrosion or paint damage. (Refer to 4-37.)

ASSEMBLY

Door Stop Assembly

1. Position catch (55) and spring (54) in lower brace (53) and install roll pin (56).

2. Install bolt (52), washers (50), nylon washer (51), nut (49), and cotter pin (48) securing lower brace (53) to upper brace (47).

3. Install bolt (45), washers (44), nut (43), and cotter pin (42), securing upper brace (47) to bracket (46).

4-17. (cont)

4. Position lanyard (41) on bracket (39) and install rivet (40). (Refer to 4-26.)

5. Insert pin (38) through lower brace (53) and bracket (39) and install hair pin (37).

6. Refinish. (Refer to para 4-37.)

Door Vent

7. Position spring (34) and install washers (33) and bolts (32).

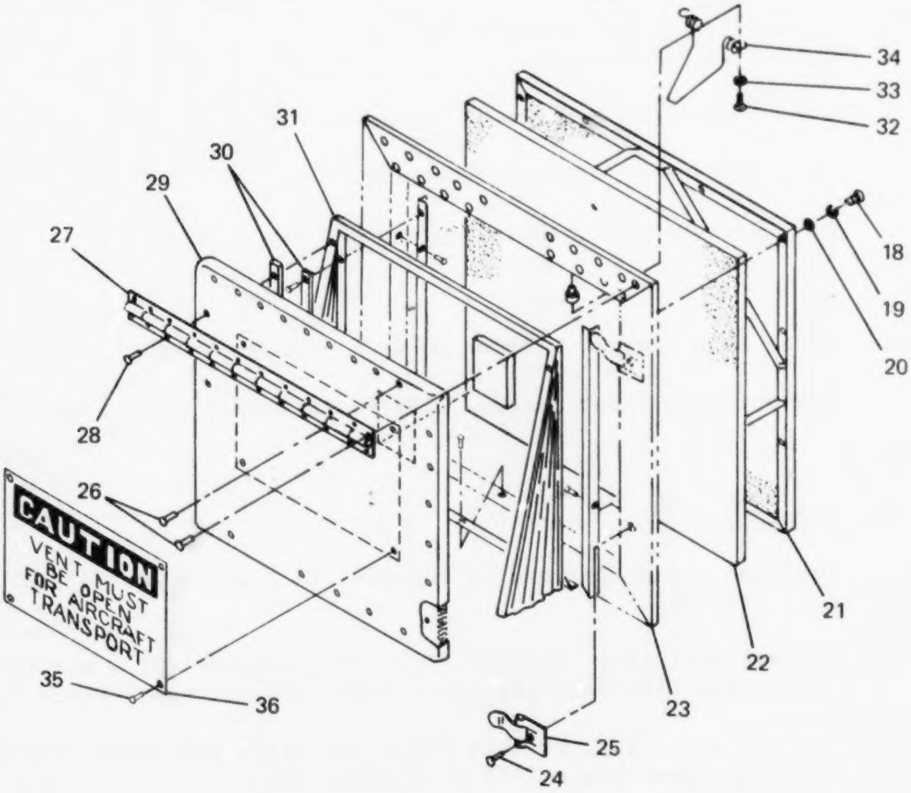
8. Assemble curtain (31), retainer strips (30), and door vent (29) and install rivets (28). (Refer to 4-26.)

9. Position hinge (27) and install rivets (26). (Refer to 4-26.)

10. Position fastener (25) and install rivet (24). (Refer to 4-26.)

11. Assemble vent frame (23), filter (22), and filter frame (21) and install washers (20), lockwashers (19), and screws (18).

12. Apply sealing compound to rear of caution plate (36), place against door vent (29) and install rivets (35). (Refer to 4-26.)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VENT MUST BE OPEN FOR AIRCRAFT TRANSPORT
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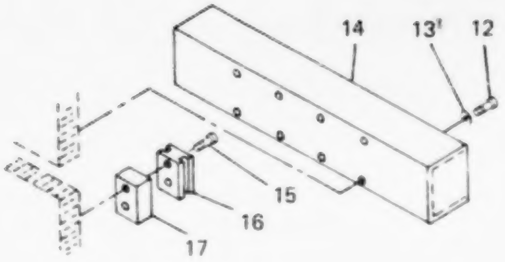
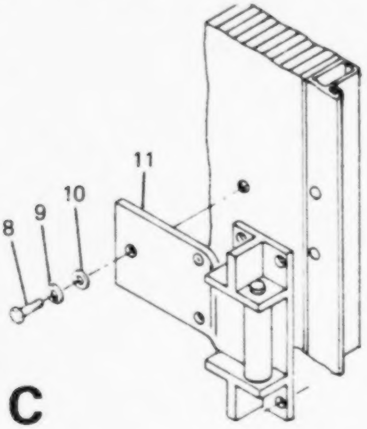
4-17. (cont)

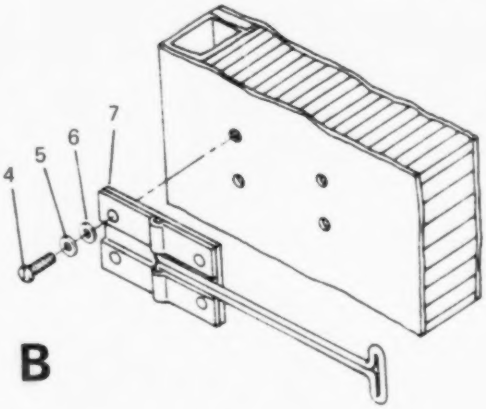
Personnel Door

13. Position spacer (17) and jack support bracket (16) on door and install screws (15).

14. Position jack storage bracket (14) on door and install lockwashers (13) and screws (12).

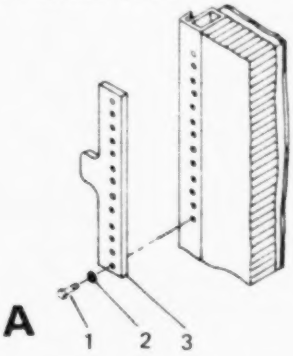






15. Position hinge base plate (11) on door and install washers (10), lock washers (9) and bolts (8).

16. Position door holder (7) on door and install washers (6), lockwashers (5), and screws (4).



17. Position personnel shear plate (3) on door and install lockwashers (2) and screws (1).

18. Seal. (Refer to para 4-36.)

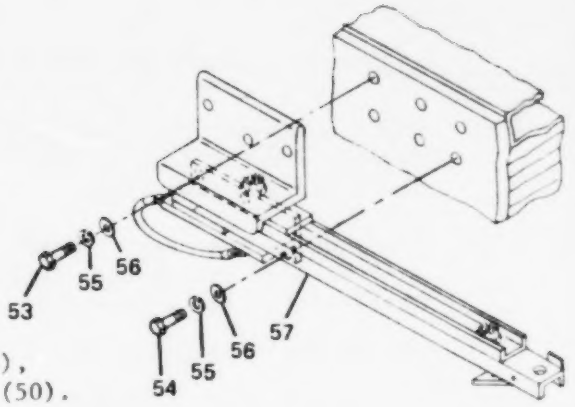
19. Refinish. (Refer to para 4-37.)

4-17. (cont)

INSTALLATION

Door Stop Assembly

1. Attach door stop (57) to door with six washers (56), lockwashers (55), and bolts (53 and 54).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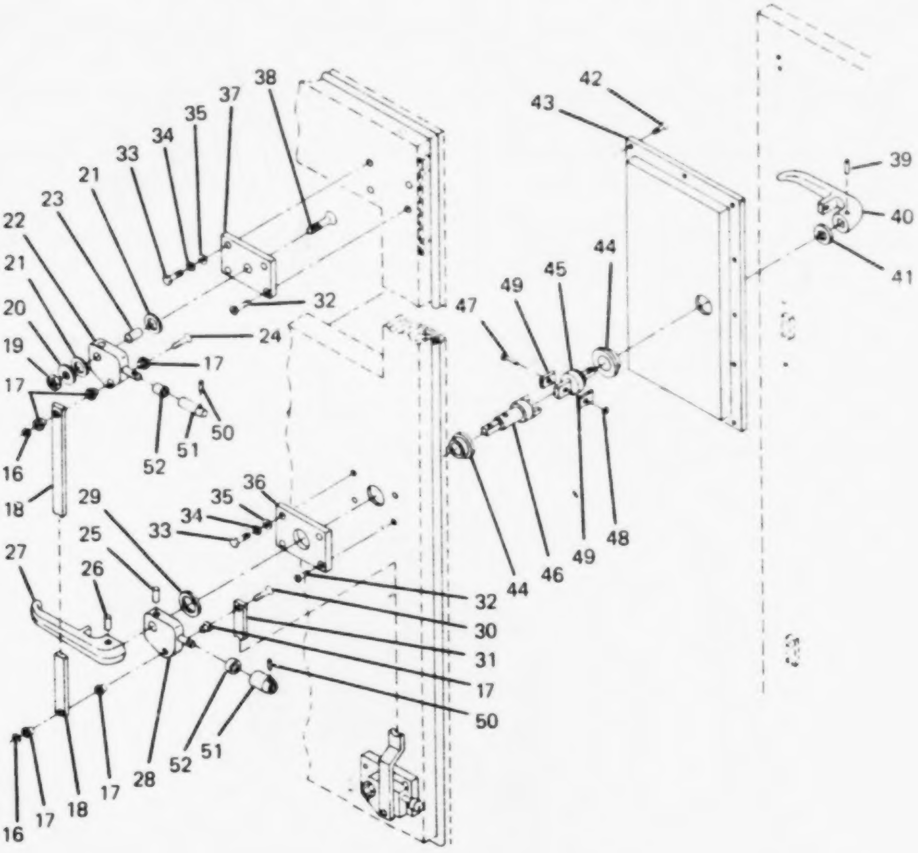
Door Lock Assembly

2. Install roller extensions (52), rollers (51), and dowel pins (50).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3. Install spacers (49), washer (48), and rivet (47). (Refer to 4-26.)

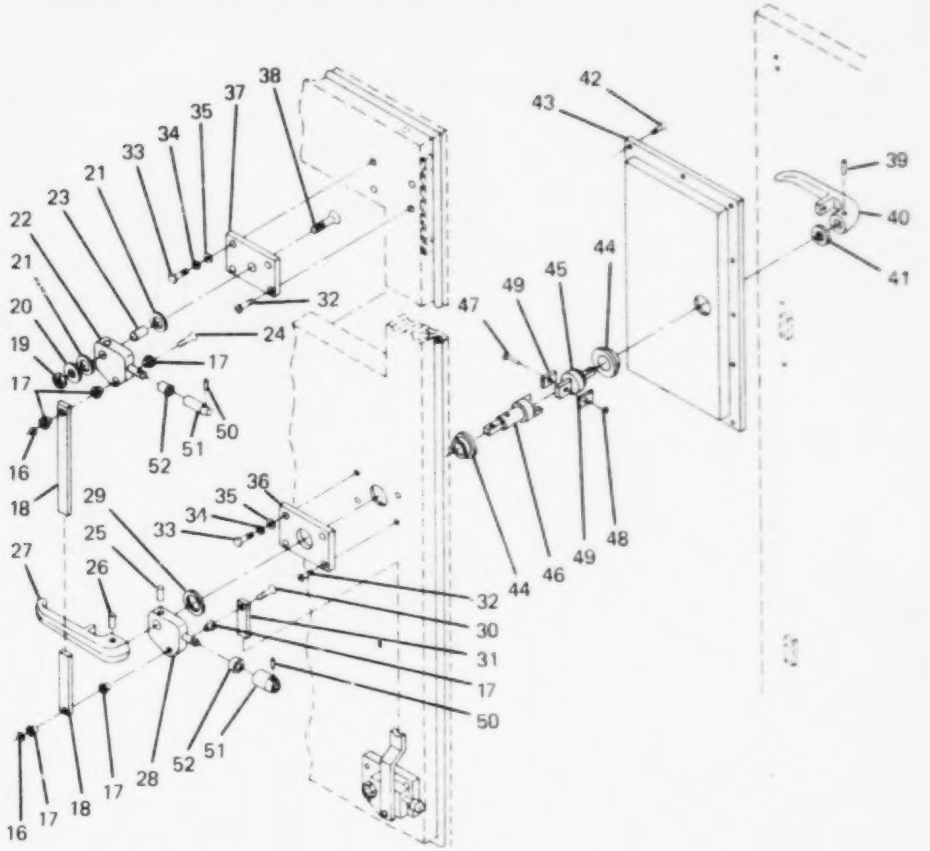
4. Install shafts (46 and 45) and flanged bearings (44) in door panel.

5. Position pan (43) and install rivets (42). (Refer to 4-26.)

4-17. (cont)

6. Position washer (41) and outside handle (40) and install dowel pin (39).

7. Insert screw (38) in mounting plate (37) and install washers (35), lockwashers (34), bolts (33), and screws (32).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8. Position mounting plate (36) and install washers (35), lockwashers (34), bolts (33), and screws (32).

9. Position bottom rod (31), pin (30), flanged bearing (17), washer (29), latch arm (28), and inside handle (27) and install dowel pins (25 and 26).

10. Position flanged bearing (17), pin (24), washer (21), spacer (23), and latch arm (22) and install washers (20 and 21) and nut (19).

11. Position flanged bearing (17), top rod (18), and flanged bearing (17) and install retaining ring (16).

12. Seal. (Refer to para 4-36.)

13. Refinish. (Refer to para 4-37.)

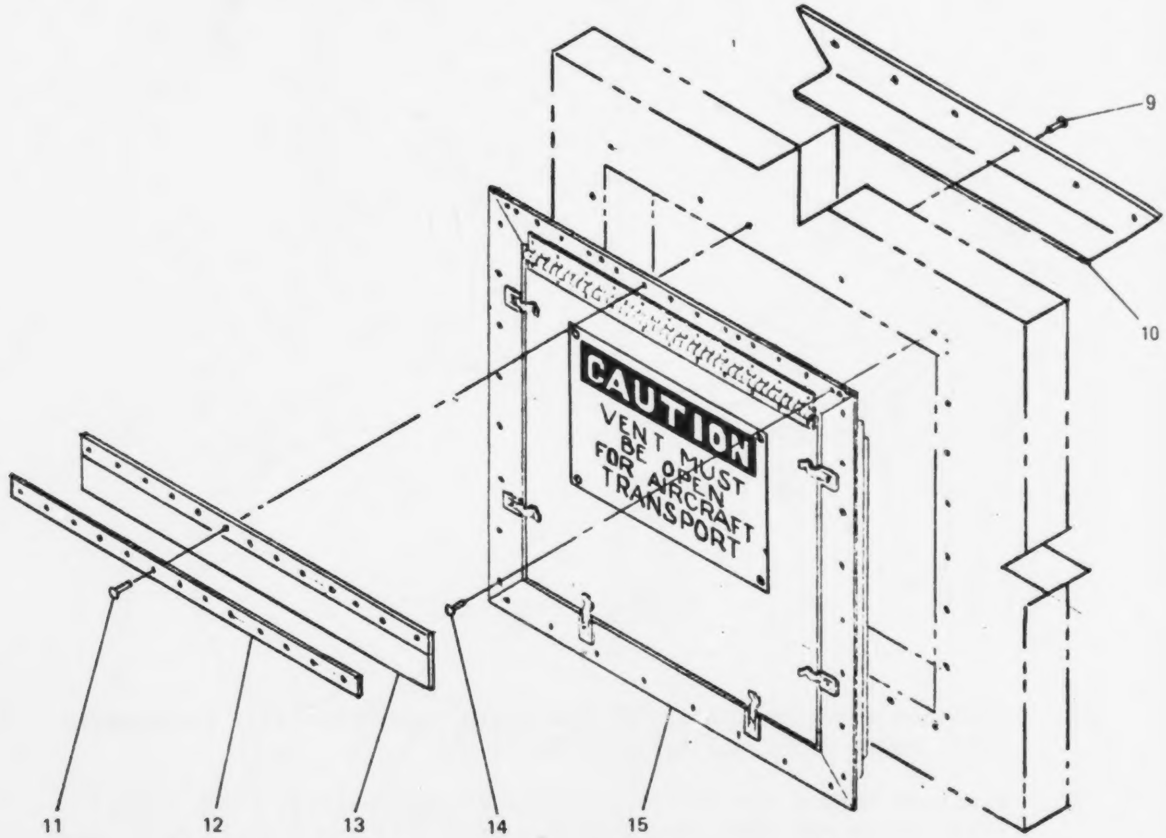
4-17. (cont)

Door Vent

14. Position vent (15) in door and install rivets (14). (Refer to 4-26.)

15. Position rain strip (13) and retainer strip (12) and install rivets (11). (Refer to 4-26.)

16. Position retainer strips (10) and install rivets (9). (Refer to 4-26.)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CAUTION
VENT MUST BE OPEN FOR AIRCRAFT TRANSPORT
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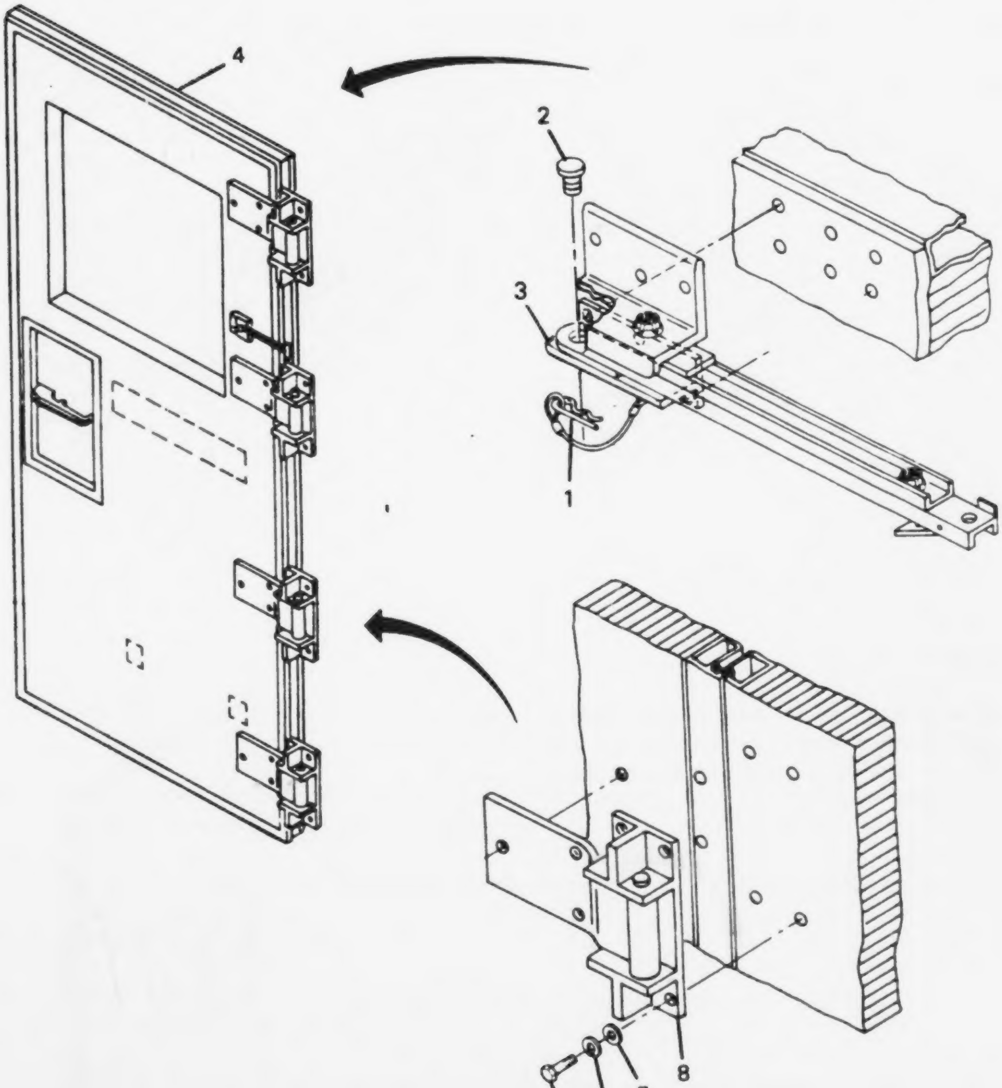
4-17. (cont)

Personnel Door

17. Secure each of four hinge base plates (8) to endwall with four washers (7), lockwashers (6), and bolts (5).

18. Position bracket (3) and install pin (2) and hairpin (1).

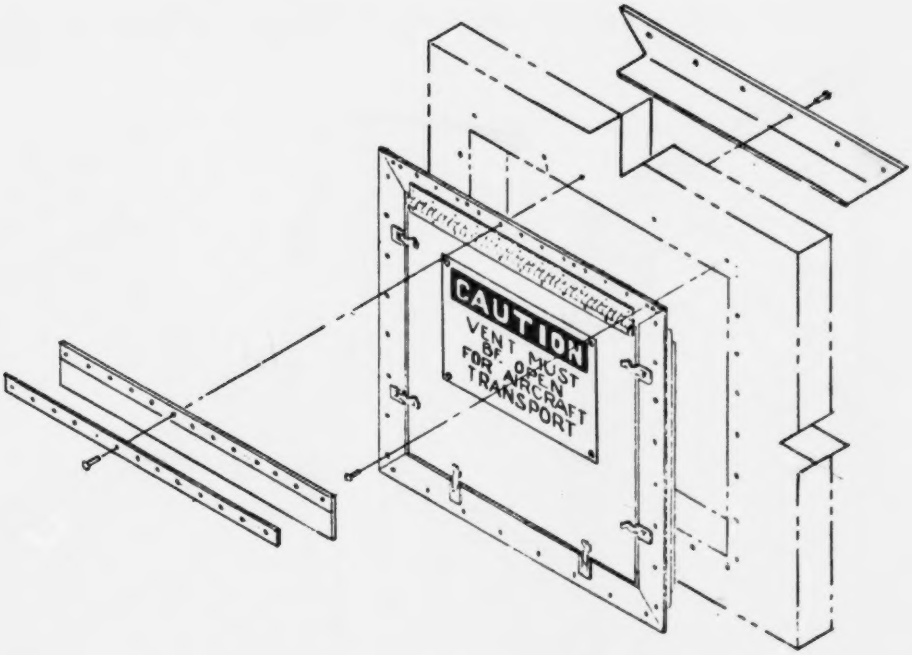


4-17. (cont)

ALIGNMENT

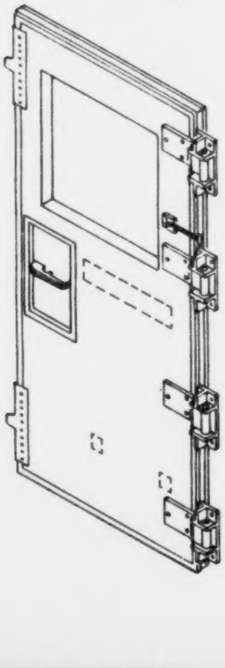
Door Vent

When installing door vent, make sure to center in door so there is an equal gap at both sides and at the top and bottom.


CAUTION
VENT MUST BE OPEN FOR AIRCRAFT TRANSPORT

Personnel Door

Loosen hinge bolts and place wedges as required around periphery of door so there is an equal gap at both sides and at top and bottom.



4-18. CONTAINER LIFT JACK ASSEMBLY

This task covers:

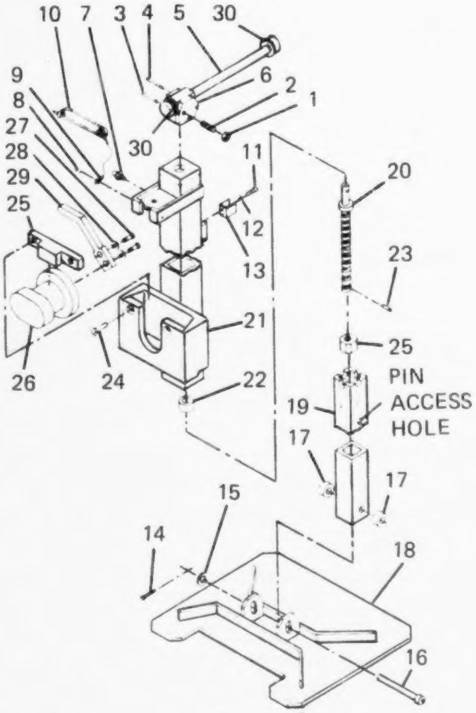
- a. Disassembly
- b. Cleaning, Inspection
- c. Repair
- d. Lubrication
- e. Assembly

INITIAL SETUP

Standard tools
General mechanics tool kit
Grease gun

Materials
Grease, Item 12, Appendix E

DISASSEMBLY



1. Remove nut (1), spring plunger (2), pin (3), and handle (4).

2. Remove pin (4) and separate handle (5) from support (6). Remove two O-rings (30) from handle (5).

3. Remove grease fitting (7).

NOTE

Do not remove lanyard unless pins or cables are damaged.

4. Remove rivet (8) to remove lanyard (9) and safety pin (10).

5. Remove screws (11), lockwashers (12), and spring tension clip (13).

6. Remove cotter pin (14), washer (15), pin (16), and spacers (17) to remove base (18) from basic jack.

7. Remove inside tube (19) and jack screw (20) from outside tube (21).

8. Remove bearing (22).

9. Drive pin (23) out through access hole and remove jack screw (20) from inside tube (19).

10. Remove screws (24), retainer (25), and rotating insert (26).

11. Remove screws (27), lockwashers (28), and handle (29). Remove O-rings (30).

4-18. (cont)

CLEANING, INSPECTION

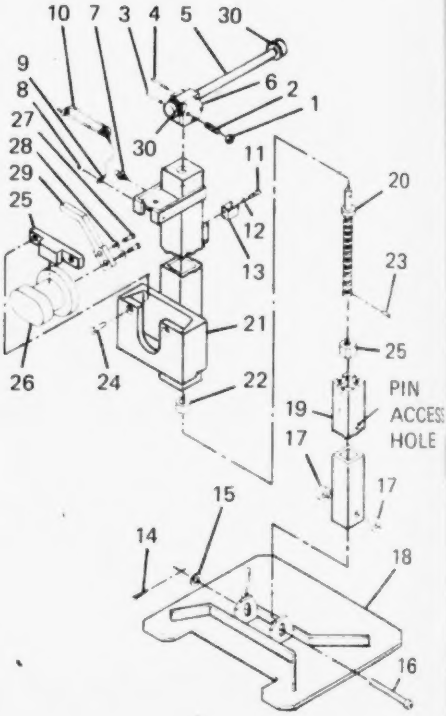
1. Wipe jack assembly and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components

   b. Corrosion or paint damage.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REPAIR

Corrosion or paint damage. (Refer to 4-37.)

LUBRICATION

Lubricate jack assembly with grease.

ASSEMBLY

1. Position handle (29) on rotating insert (26) and install lockwashers (28) and screws (27). Install O-rings (30).

2. Position rotating insert (26) in outside tube (21) and secure retainer (25) with screws (24).

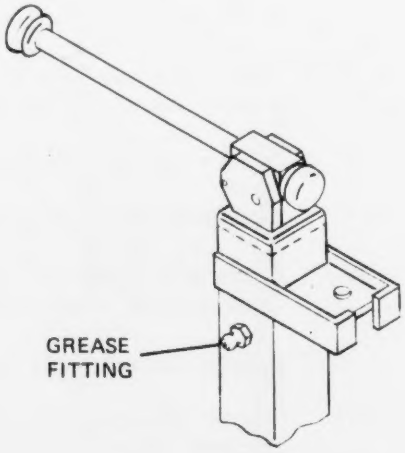
3. Install jack screw (20) in inside tube (19).

4. Align hole in jack screw (20) with access hole in inside tube (19) and install pin (23).

5. Pack bearing (22) with grease and place on jack screw (20).

6. Install inside tube (19) in outside tube (21).

7. Position handle (5) in support (6) and on jack screw (19) with holes in handle yoke and jack screw aligned. Install pins (3 and 4).


GREASE
FITTING

4-18. (cont)

8. Install spring plunger (2) in handle yoke and secure with nut (1). Adjust nut to control handle movement.

9. Position basic jack on base (18) with spacers (17) and secure with pin (16), washer (15), and new cotter pin (14).

10. Install grease fitting (7) and lubricate jack with grease.

4-19. FRONT ENDWALL PANEL

This task covers:

a. Removal	d. Repair
b. Disassembly	e. Assembly
c. Cleaning, Inspection	f. Installation

INITIAL SETUP

Special Tools
Hand blind riveter, Appendix B, Item 2
Personnel - 4
1 Electrician

Materials
Adhesive, Item 2, Appendix E
Standard tools
General mechanics tool kit
Electrical tool kit

REMOVAL

Front Endwall Panel

1. Set main circuit breaker to OFF position.

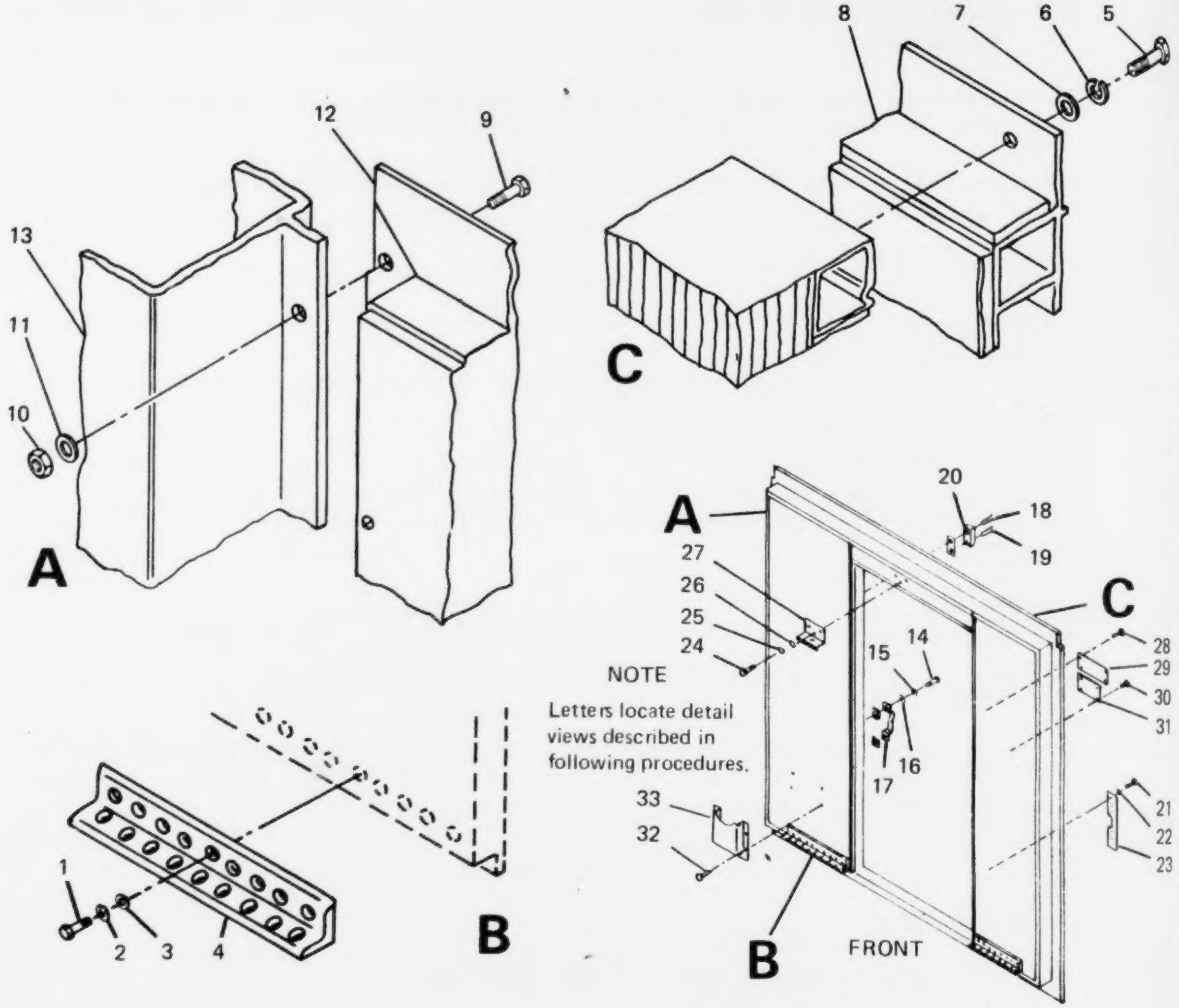
2. Disconnect service entry power at power entry panel and remove panel. (Refer to para 4-8, panel wiring.)

3. Remove door activated blackout switch and associated wiring. (Refer to 4-14.)

4. Remove area light assembly. (Refer to 3-4.)

5. Remove circuit breaker box. (Refer to para 4-7.)

4-19. (cont)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NOTE

Letters locate detail views described in following procedures.

5. Remove screws (1), lockwashers (2), and washers (3) securing reinforcement angles (4) to endwall.

6. Remove bolts (5), lockwashers (6) and washers (7) securing endwall (8) to roof and floor.

7. Remove bolts (9), nuts (10), and washers (11) securing endwall (12) to corner posts (13).

8. Remove screws (14), lockwashers (15), and washers (16) and remove ice break (17).

4-19. (cont)

9. Remove screws (18 and 19) and remove keepers (20).

10. Remove screws (21), lockwashers (22), and shear plates (23).

11. Remove screws (24), lockwashers (25), washers (26), and door assembly mounting bracket (27).

12. Remove rivets (28) and identification plate (29).

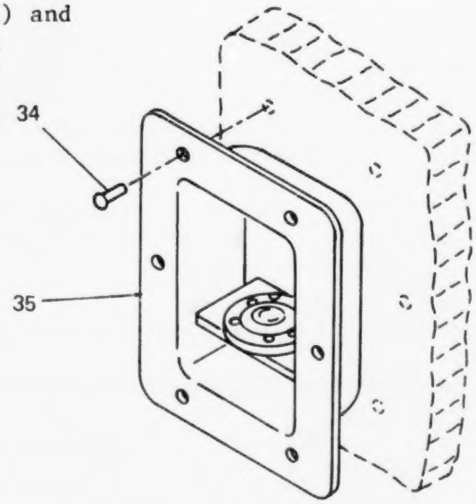
13. Remove rivets (30) and paint plate (31).

14. Remove rivets (32) and manual holder (33).

15. Support endwall and remove by using a putty knife (or similar tool) to break bond between endwall and roof, floor, and corner posts.

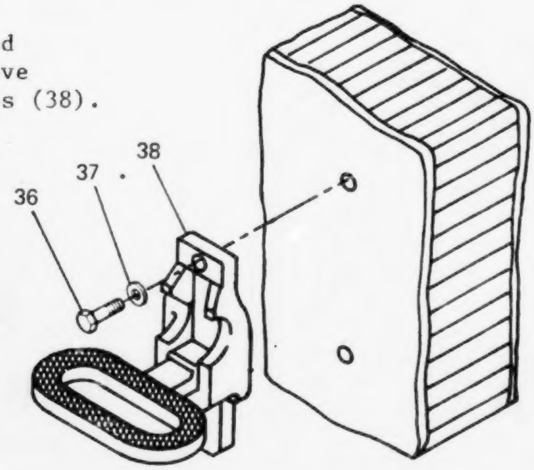
Level Assembly

16. Drill out six rivets (34) and remove each of two level assemblies (35). (Refer to 4-26.)



Folding Step

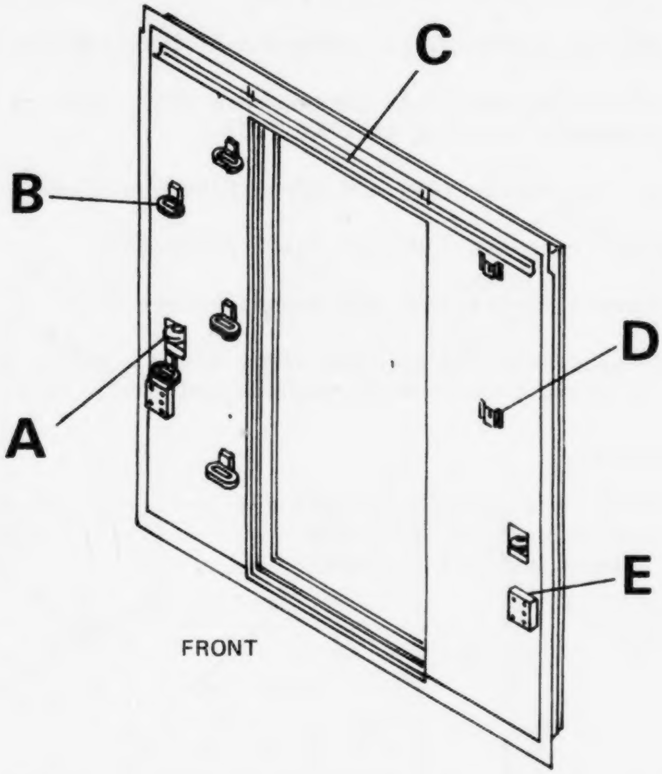
17. Remove two screws (36) and lockwashers (37) and remove each of five folding steps (38).



4-19. (cont)

DISASSEMBLY

Front Endwall Panel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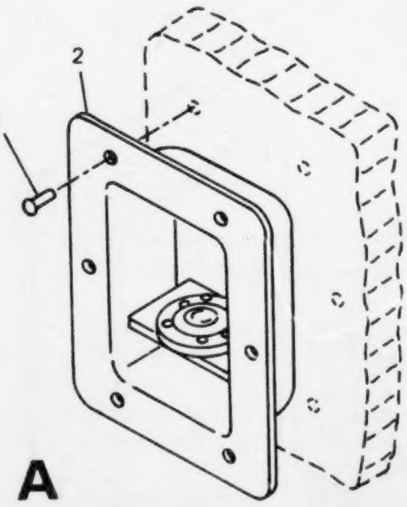
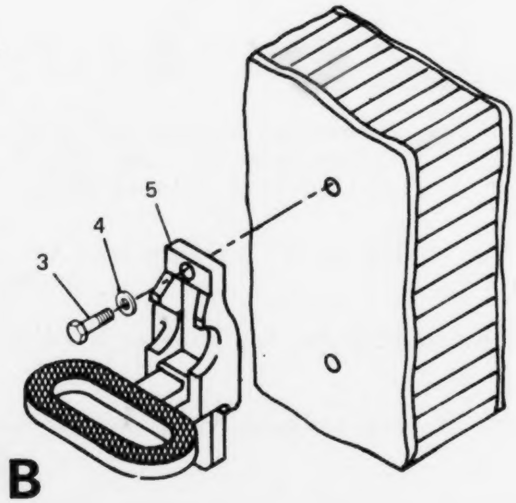
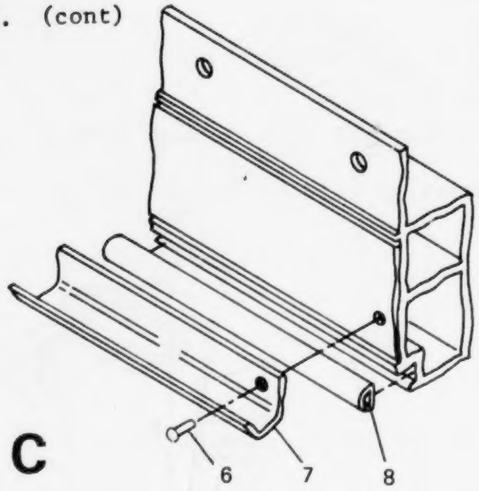
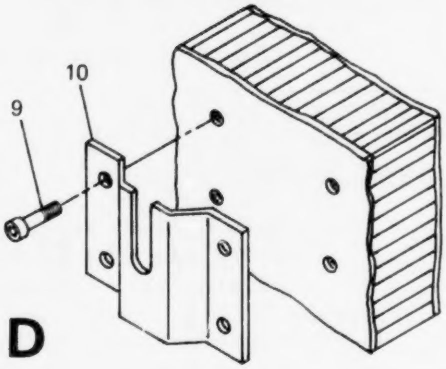
1. Drill out rivets (1) and remove level (2). (Refer to 4-26.)
2. Remove screws (3) and lockwashers (4) and remove folding step (5).





4-19. (cont)



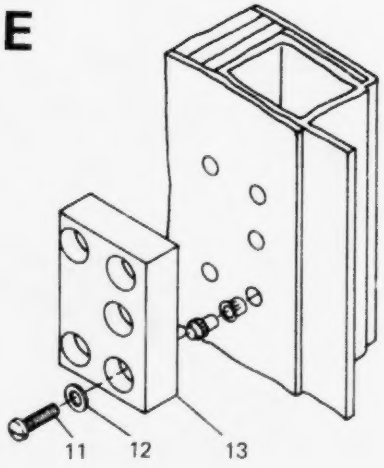


3. Drill out rivets (6) and remove drip strip (7). (Refer to 4-26.)

4. Strip seal (8) away from door opening.

5. Drill out rivets (9) and remove light bracket (10). (Refer to 4-26.)

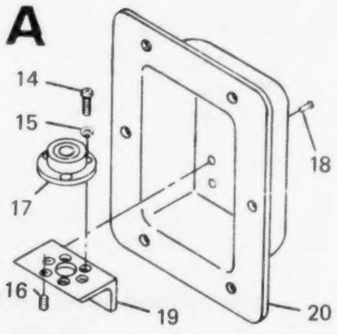
6. Remove screws (11) and lockwashers (12) and remove upper mobilizer fitting (13).



Level Assembly

7. Remove screws (14), lockwashers (15), and setscrews (16) and remove level indicator (17) from level bracket (19).

8. Drill out rivets (18) and remove level bracket (19) from level pan (20). (Refer to 4-26.)



CLEANING, INSPECTION

1. Wipe panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components

   b. Corrosion or paint damage.

4-19. (cont)

REPAIR

1. Panel skin damage. (Refer to paragraphs 4-25 through 4-36.)

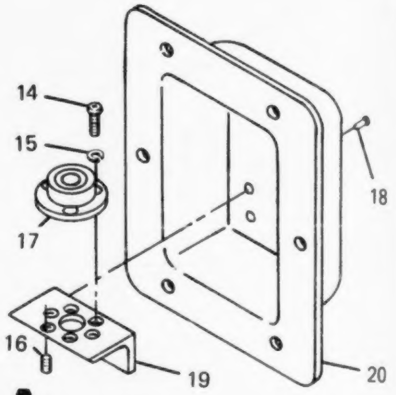
2. Corrosion or paint damage. (Refer to 4-37.)

ASSEMBLY

Level Assembly

1. Secure level bracket (19) to level pan (20) by installing rivets (18). (Refer to 4-26.)

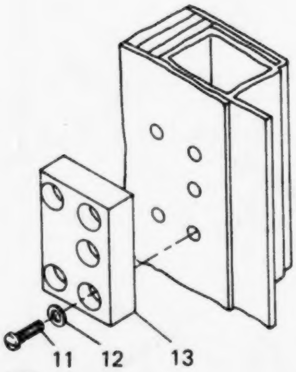
2. Position level indicator (17) on level bracket and install setscrews (16), lockwashers (15), and screws (14).



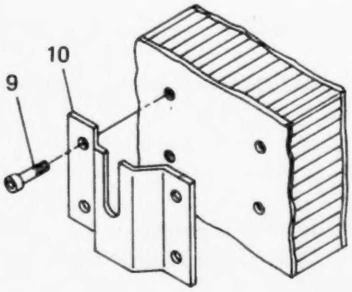
A

Front Endwall Panel

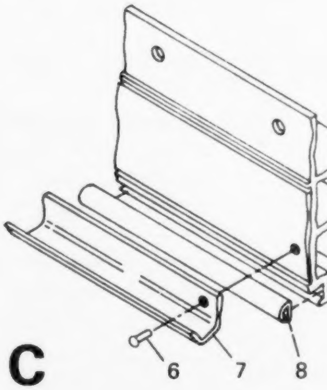
3. Position mobilizer fitting (13) and install lockwashers (12) and screws (11).



E



D



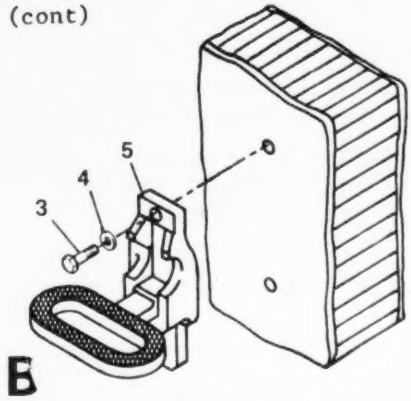
C

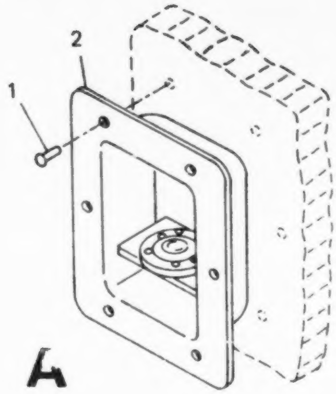
4. Position light bracket (10) and install rivets (9). (Refer to 4-26.)

5. Bond seal (8) in place with adhesive. (Refer to 4-34.)

6. Position drip strip (7) and install rivets (6). (Refer to 4-26.)

4-19. (cont)





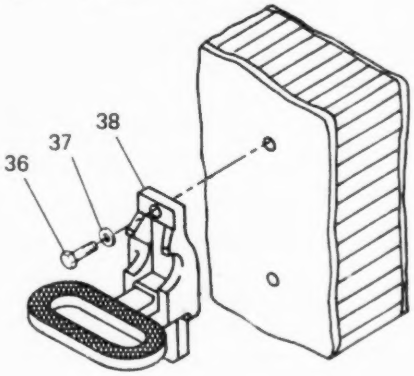
7. Position folding step (5) and install lockwashers (4) and screws (3).

8. Position level (2) and install rivets (1). (Refer to 4-26.)

INSTALLATION

Folding Step

1. Position each of five folding steps (38) against panel and install two lockwashers (37) and screws (36).

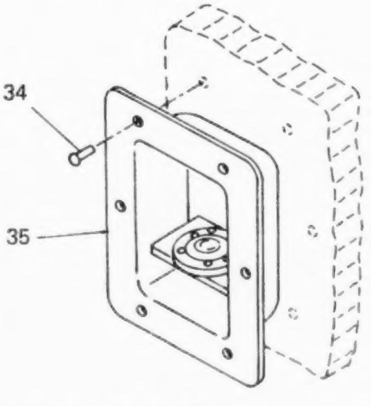


Level Assembly

2. Secure each of two level assemblies (35) by installing six rivets (34). (Refer to 4-26.)

NOTE

Level assemblies must be calibrated after assembly of shelter is complete. Use a four foot level or other suitable tool and adjust three setscrews on level to calibrate.



Front Endwall Panel

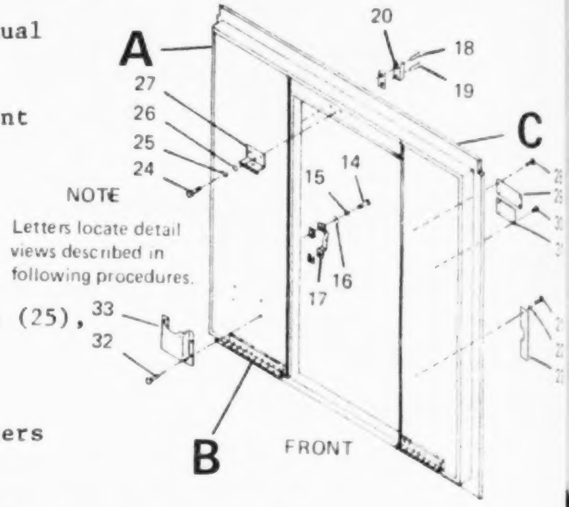
3. From outside shelter, position endwall on floor and push inward until endwall is against corner posts mating surfaces.

4. Align endwall mounting holes with mounting holes and inserts in corner posts, roof, reinforcement angles, and floor.

4-19. (cont)

NOTE

> Align mounting holes at endwall corners and insert bolts. Check that remaining holes and inserts are aligned and free from obstructions.



NOTE

Letters locate detail views described in following procedures.

5. Install rivets (32) securing manual holder (33). (Refer to 4-26.)

6. Install rivets (30) securing paint plate (31). (Refer to 4-26).

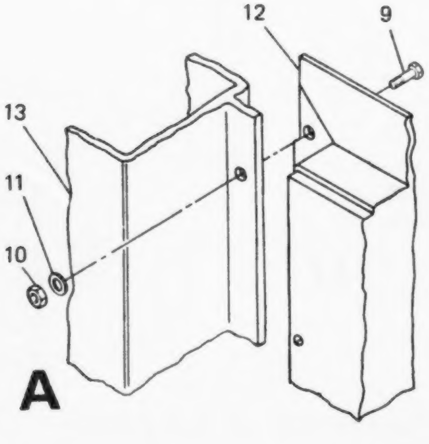
7. Install rivets (28) securing identification plate (29). (Refer to 4-26.)

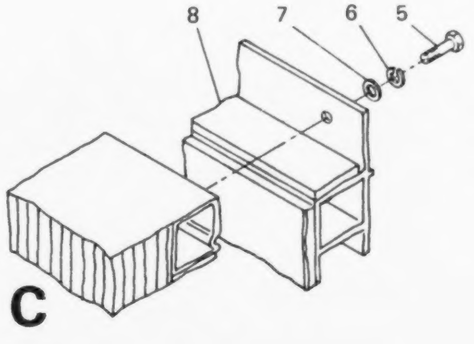
8. Install screws (24), lockwashers (25), and washers (26) securing door assembly mounting bracket (27).

9. Install screws (21) and lockwashers (22) securing shear plates (23).

10. Install screws (18 and 19) securing keepers (20) to endwall.

11. Install screws (14), lockwashers (15), and washers (16) securing ice break (17) to endwall.

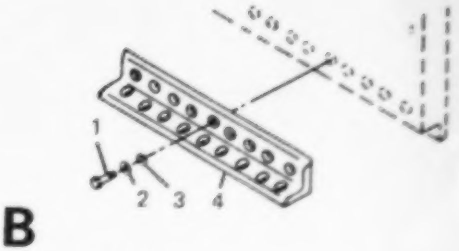




12. Install bolts (9), washers (11), and nuts (10) securing endwall (12) to corner posts (13).

13. Install washers (7), lockwashers (6), and bolts (5) securing endwall (8) to roof and floor.

4-19. (cont)



14. Install washers (3), lockwashers (2), and screws (1) securing reinforcement angles (4) to endwall.

15. Install area light assembly. (Refer to 3-4.)

16. Install door activated blackout switch and associated wiring. (Refer to 4-14.)

17. Install power entry panel. (Refer to 4-8.)

18. Install circuit breaker box. (Refer to 4-7.)

19. Connect services entry power and set main circuit breaker to ON position.

4-20. REAR ENDWALL PANEL

This task covers:

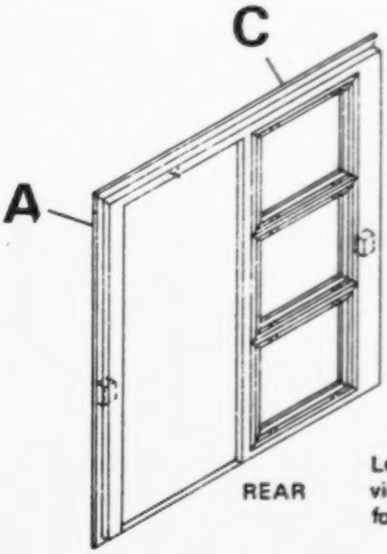
- a. Removal
- b. Disassembly
- c. Cleaning, Inspection
- d. Repair
- e. Assembly
- f. Installation

INITIAL SETUP

Special Tools
  Hand blind riveter, Appendix B, Item 2
Standard Tools
  General mechanics tool kit

Materials
  Adhesive, Item 2, Appendix E
Personnel - 4

REMOVAL



NOTE
Letters locate detail views described in following procedures.

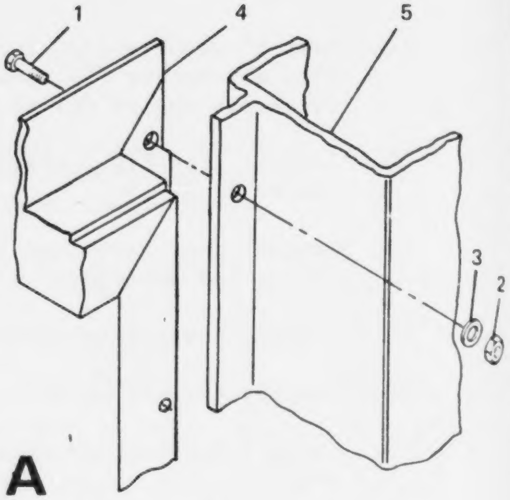
4-20. (cont)

1. Remove rear personnel door in accordance with paragraph 4-17.

2. Remove bolts (1), nuts (2) and washers (3) securing endwall (4) to corner posts (5).

3. Remove bolts (6), lockwashers (7), and washers (8) securing drip cap (9) and endwall (4) to roof.

4. Remove bolts (6), lockwashers (7), and washers (8) securing endwall (4) to floor.



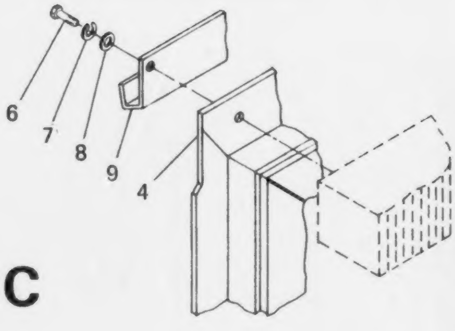
5. Remove screws (10), lockwashers (11), and shear plates (12).

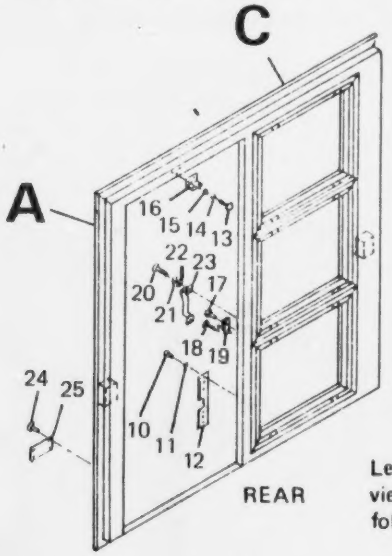
6. Remove screws (13), lockwashers (14), washers (15), and door assembly mounting bracket (16).

7. Remove screws (17 and 18) and keepers (19).

8. Remove screws (20), lockwashers (21), washers (22), and ice break (23).

9. Remove rivets (24) and safety approval plate (25).



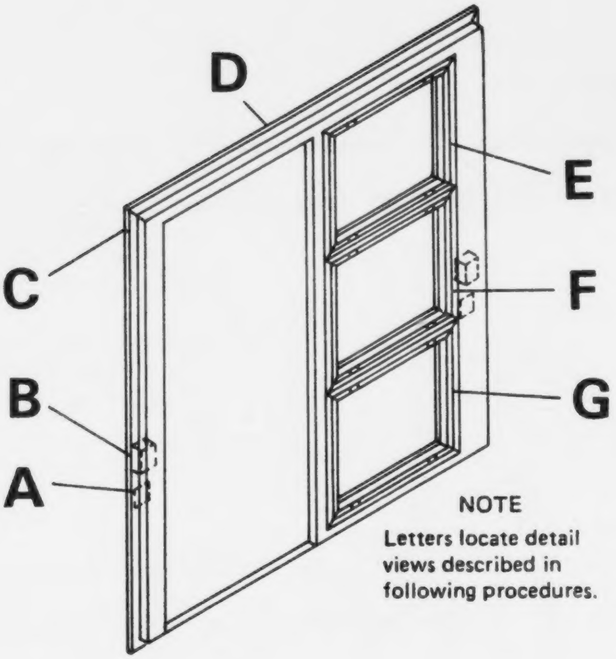


NOTE
Letters locate detail views described in following procedures.

10. Support endwall, cut through adhesive sealant, and remove by using a putty knife (or similar tool) to break bond between endwall and roof, floor, and corner posts.

4-20. (cont)

DISASSEMBLY

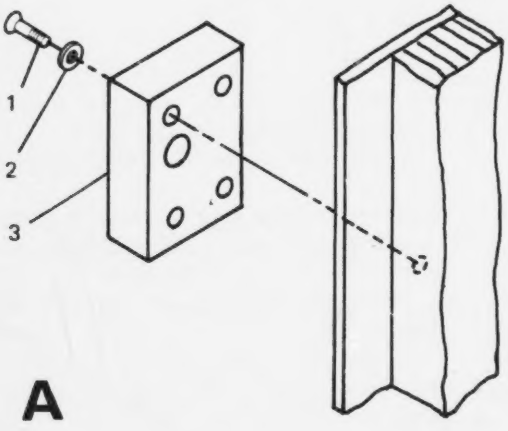


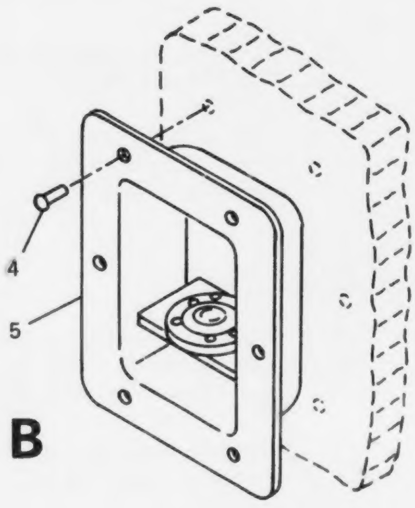
NOTE
Letters locate detail
views described in
following procedures.

Rear Endwall Panel

1. Remove screws (1) and lockwashers (2) and remove upper mobilizer fittings (3).

2. Drill out rivets (4) and remove level pan (5). (Refer to 4-26.)

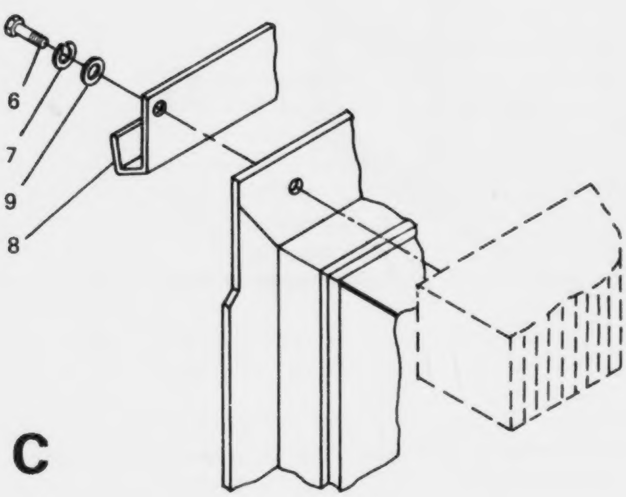




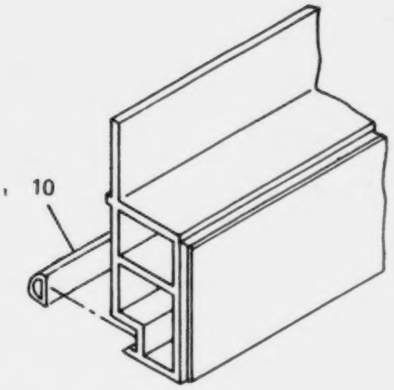
4-20. (cont)

3. Remove bolts (6), lockwashers (7), drip cap (8), and washers (9).

4. Strip seal (10) away from opening.



C



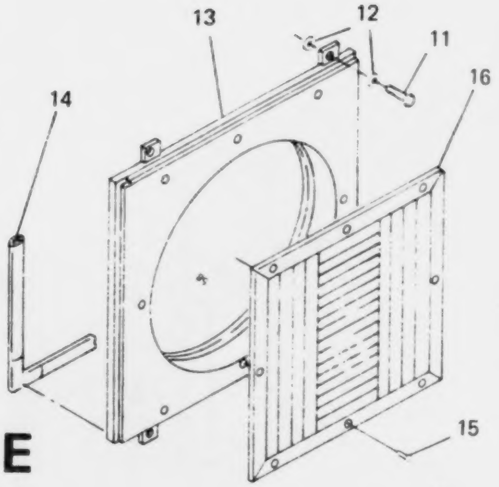
D

ECU Intake Panel

5. Remove captive screw (11) and two washers (12) at each of four locations on ECU intake panel (13).

6. Remove weather seal (14) from ECU intake panel (13). (Refer to 4-34.)

7. Drill out rivets (15) and remove vent cover grill (16) from ECU intake panel (13). (Refer to 4-26.)

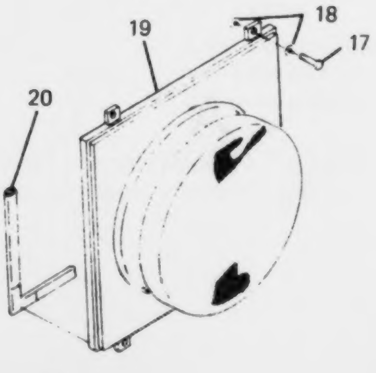


E

ECU Return Panel

8. Remove captive screw (17) and two washers (18) at each of four locations on ECU return panel (19).

9. Remove weather seal (20) from ECU return panel (19). (Refer to 4-34.)



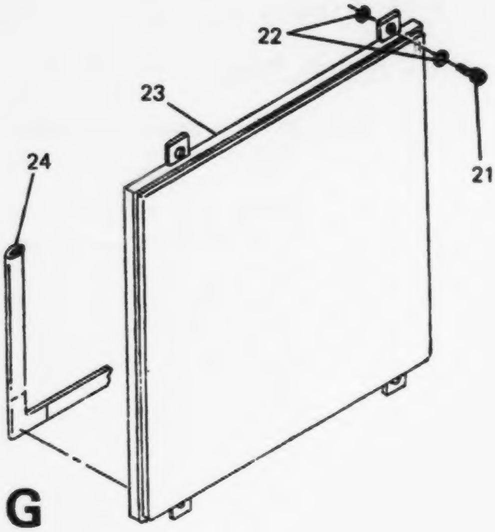
F

4-20. (cont)

Closeout Panel

10. **Remove captive screw (21) and two washers (22) at each of four locations on ECU intake and return closeout panels (23).**

11. Remove weather seals (24) from ECU intake and return closeout panels (23). (Refer to 4-34.)



CLEANING, INSPECTION

1. Clean panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

    a. Missing or damaged components

    b. Corrosion or paint damage.

REPAIR

1. Panel skin damage. (Refer to paragraphs 4-25 through 4-36.)

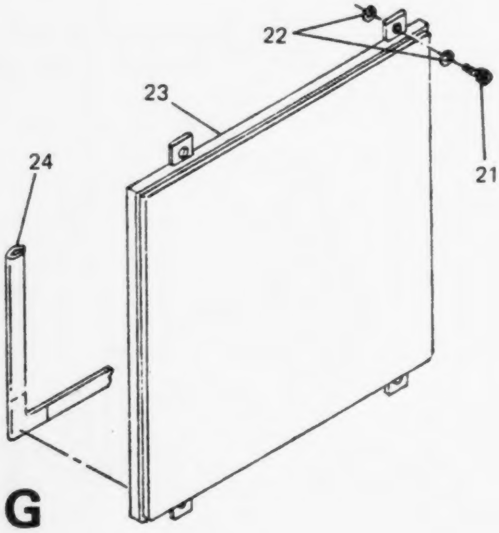
2. Corrosion or paint damage. (Refer to 4-37.)

ASSEMBLY

Closeout Panel

1. Attach weather seals (24) to ECU intake and return closeout panels (23). (Refer to 4-34.)

2. Using installation tool, assemble two washers (22) and captive screw (21) at each of four locations on ECU intake and return closeout panels (23).

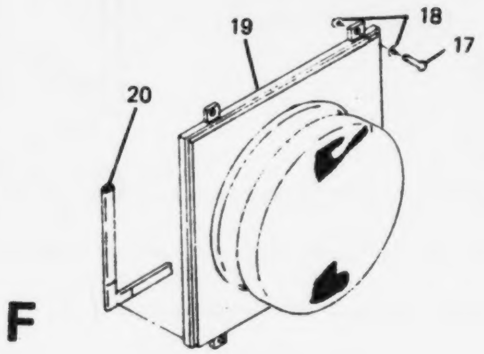


4-20. (cont)

ECU Return Panel

3. Attach weather seal (20) to ECU return panel (19) with adhesive. (Refer to 4-34.)

4. Using installation tool, assemble two washers (18) and captive screw (17) at each of four locations on ECU return panel (19).

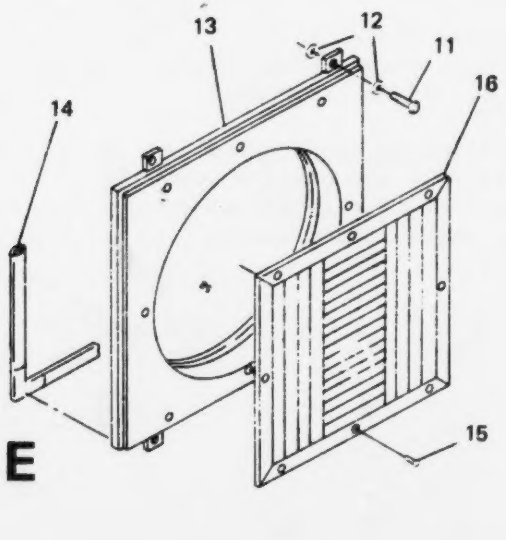


ECU Intake Panel

5. Position vent cover grill (16) on ECU intake panel (13) and secure with rivets (15). (Refer to 4-26.)

6. Attach weather seal (14) to ECU intake panel (13) with adhesive. (Refer to 4-34.)

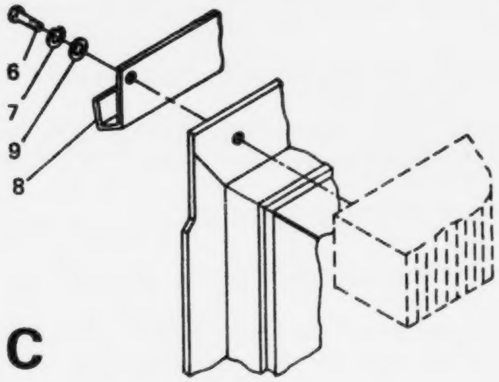
7. Using installation tool, assemble two washers (12) and captive screw (11) at each of four locations on ECU intake panel (13).



4-20. (cont)

Rear Endwall Panel

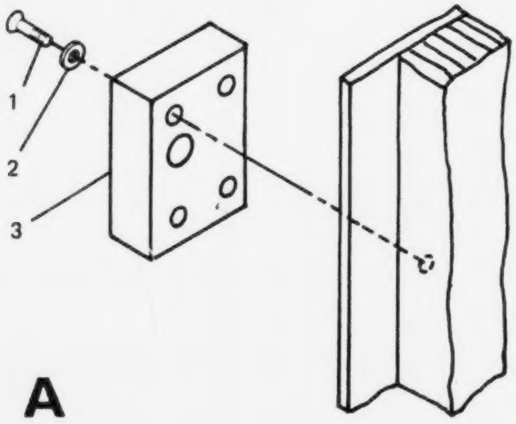
8. When assembling endwall panel to roof, position drip cap (8) and install washers (9), lockwashers (7) and bolts (6).

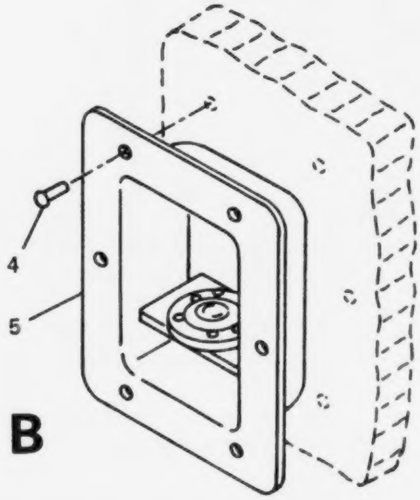


9. Position upper mobilizer fitting (3) and install lockwashers (2) and screws (1).

10. Position level (5) and install rivets (4). (Refer to 4-26.)

11. Bond seal (10) in place with adhesive. (Refer to 4-34.)





4-20. (cont)

INSTALLATION

1. Install rivets (23) securing safety approval plate (24). (Refer to 4-26.)

2. Install screws (20), lockwashers (21), and washers (22) securing ice break (23).

3. Install screws (17 and 18) securing keepers (19).

4. Install screws (13), lockwashers (14), and washers (15) securing door assembly mounting bracket (16).

5. Install screws (10) and lockwashers (11) securing shear plates (12).

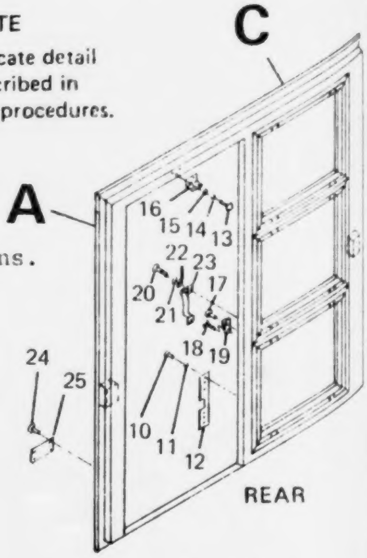
6. Apply adhesive before positioning endwall panel.

7. From outside shelter, position endwall on floor and push inward until endwall is against corner posts mating surfaces.

8. Align endwall mounting holes with mounting holes and inserts in corner posts, roof, and floor.

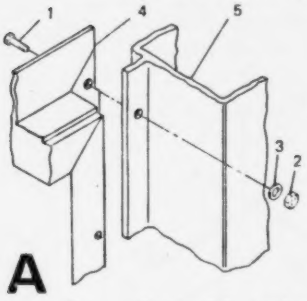
NOTE

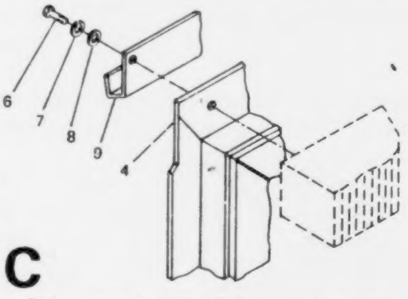
Letters locate detail views described in following procedures.



NOTE

Align mounting holes at endwall corners and install bolts. Check that remaining holes and inserts are aligned and free from obstructions.





9. Install bolts (1), washers (3), and nuts (2) securing endwall (4) to corner posts (5).

10. Install washers (8), drip cap (9), lockwashers (7), and bolts (6) securing endwall (4) to roof.

11. Install washers (8), lockwashers (7), and bolts (6) securing endwall (4) to floor.

12. Install personnel door in accordance with paragraph 4-17.

13. Calibrate level after shelter is assemblied using four-foot level and three setscrews to properly calibrate.

4-21. SIDEWALL PANEL

This task covers:

- **a. Removal**
- **b. Disassembly**
- **c. Cleaning, Inspection**
- **d. Repair**
- **e. Assembly**
- **f. Installation**

INITIAL SETUP

Special Tools
Hand blind riveter, Appendix B, Item 2
Installation tool, Appendix B, Item 3

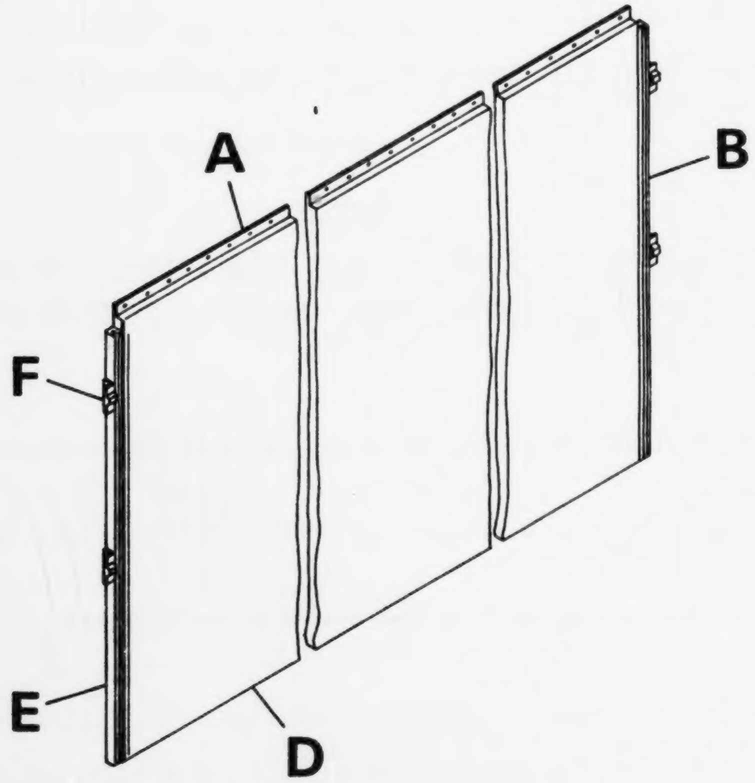
Standard Tools
General mechanics tool kit
Electrical tool kit

Personnel - 4
1 Electrician

Equipment Condition
ECU panels removed from sidewall panel
Electrical components removed (Para 4-12)

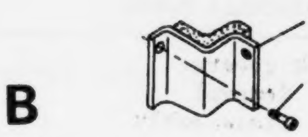
Materials
Adhesive, Item 3, Appendix E
Sealing Compound, Item 19, Appendix E
Solvent, Item 20, Appendix E

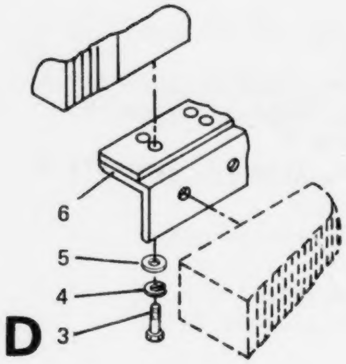
REMOVAL

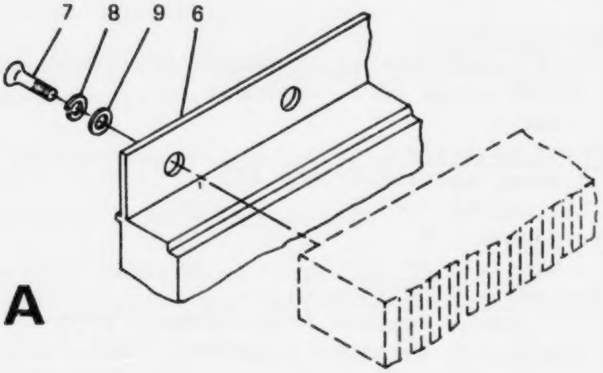


4-21. (cont)

1. Remove screws (1) securing two corner enclosures (2) to sidewall panel (6).







2. Remove bolts (3), lockwashers (4), and washers (5) securing sidewall panel (6) to floor.

3. Remove bolts (7), lockwashers (8), and washers (9) securing sidewall panel (6) to roof.

WARNING

Methylethylketone is flammable and toxic and shall be used in a well-ventilated area away from sparks or open flame. Gloves should be worn when used.

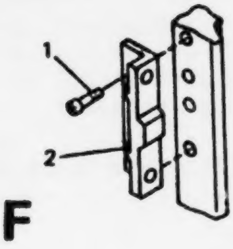
4. Apply solvent to sealed interface areas of sidewall panel and mating surfaces.

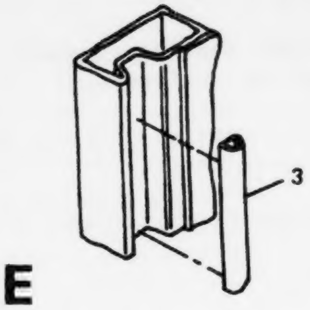
5. Block or support sidewall panel from outside shelter and use putty knife to break sealant.

6. Push from inside shelter and remove sidewall panel.

4-21. (cont)

DISASSEMBLY





1. Drill out rivets (1) and remove shear plate (2). (Refer to 4-26.)
2. Strip seal (3) from sidewall panel.

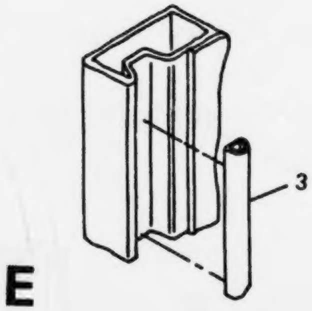
CLEANING, INSPECTION

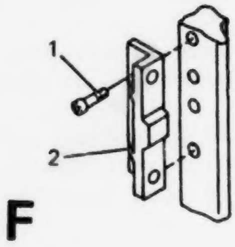
1. Wipe sidewall panel and component surfaces.
2. Inspect mounting surfaces for corrosion and damage.
3. Inspect for and replace if necessary:
    a. Missing or damaged components
    b. Corrosion or paint damage.

REPAIR

1. Panel skin damage (Refer to paragraphs 4-25 through 4-36.)
2. Corrosion or paint damage. (Refer to 4-37.)

ASSEMBLY





1. Coat seal (3) with adhesive and install. (Refer to 4-34.)
2. Position shear plate (2) and install rivets (1). (Refer to 4-26.)

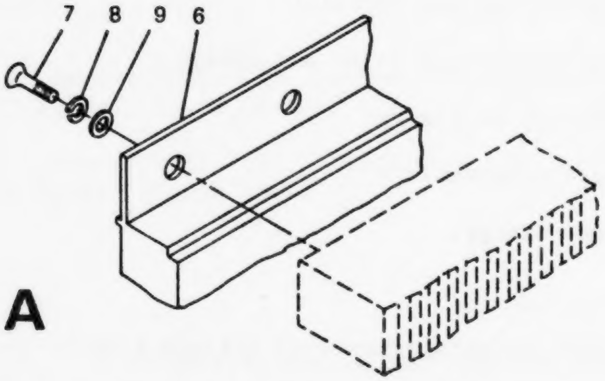
4-21. (cont)

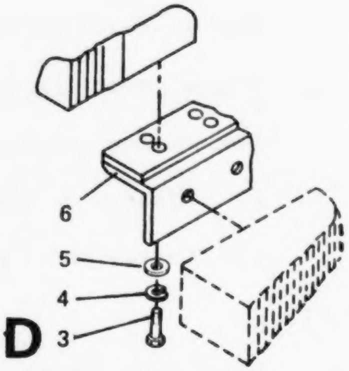
INSTALLATION

1. Apply sealing compound to interface areas of sidewall panel (6) and mating surfaces.
2. From outside shelter, position sidewall panel (6) on floor and push inward until sidewall is against mating surfaces.
3. Align sidewall panel mounting holes with inserts in roof and floor.

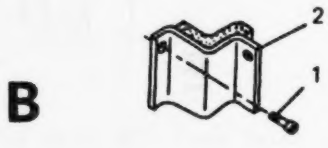
NOTE

Align mounting holes at sidewall panel corners and install bolts. Check that remaining holes and inserts are aligned and free from obstructions.





4. Install washers (9), lockwashers (8), and bolts (7) securing sidewall panel (6) to roof.
5. Install washers (5), lockwashers (4) and bolts (3) securing sidewall panel (6) to floor.
6. Align corner enclosures (2) with anchors in sidewall panel (6) and install screws (1).



4-22. ROOF PANEL

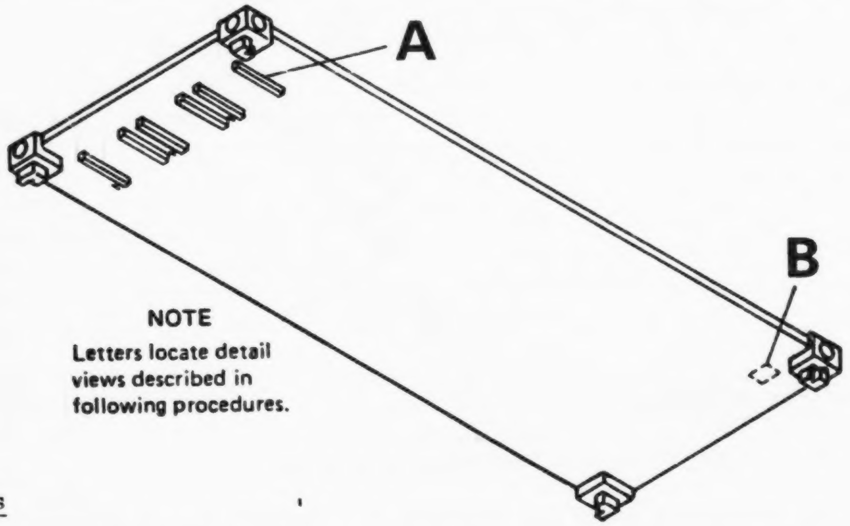
This task covers:
- a. Disassembly
- b. Cleaning, Inspection
- c. Repair
- d. Assembly

INITIAL SETUP

Standard tools
General mechanics tool kit

Personnel - 1

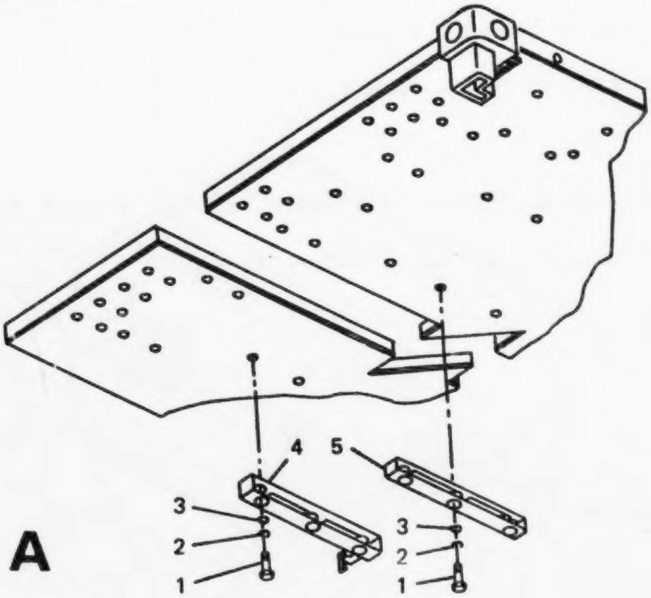
DISASSEMBLY



NOTE
Letters locate detail views described in following procedures.

Stowage Brackets

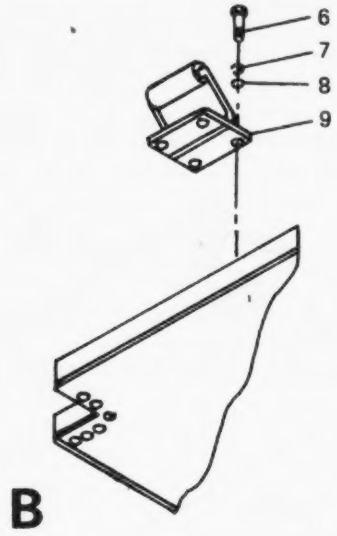
1. Remove screws (1), lockwashers (2), and washers (3) and remove stowage brackets (4 and 5).



4-22. (cont)

Folding Handle

2. Remove screws (6), lockwashers (7), and washers (8) and remove handle (9).



CLEANING, INSPECTION

1. Wipe panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

    a. Missing or damaged components

    b. Corrosion or paint damage.

REPAIR

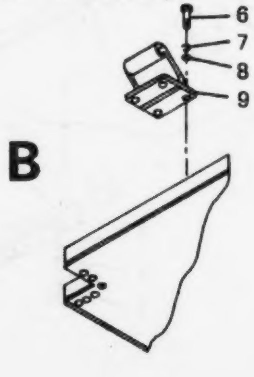
1. Panel skin damage (Refer to paragraphs 4-25 through 4-36.)

2. Corrosion or paint damage. (Refer to 4-37.)

ASSEMBLY

Folding Handle

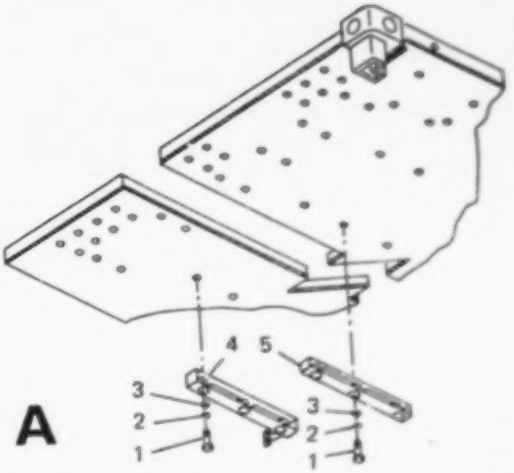
1. Position handle (9) on top of fixed roof and install washers (8), lockwashers (7), and screws (6).



4-22. (cont)

Stowage Brackets

2. Position stowage brackets (4 and 5) and install washers (3), lockwashers (2), and screws (1).



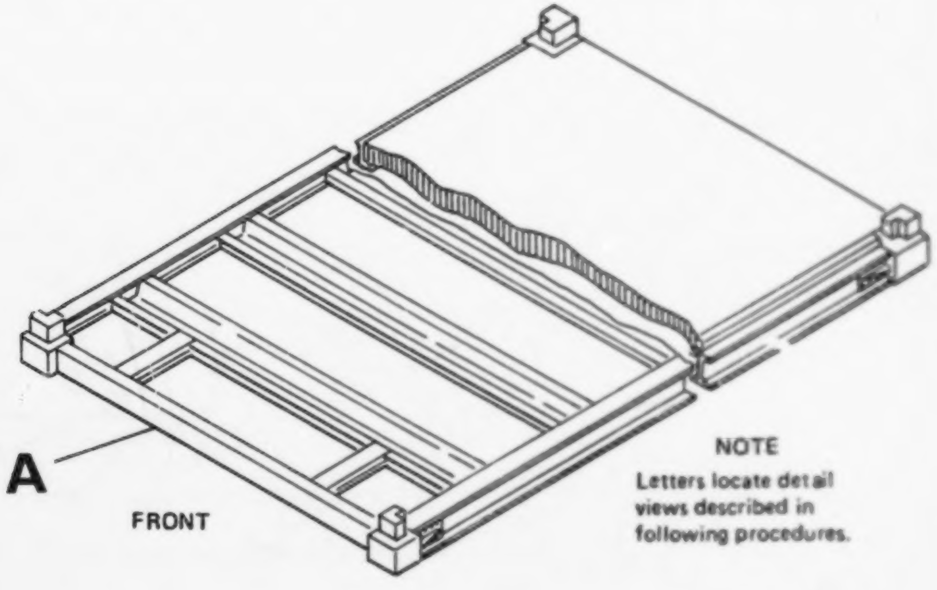
4-23. FLOOR PANEL/BASE FRAME

This task covers:
- a. Disassembly
- b. Cleaning, Inspection
- c. Assembly

INITIAL SETUP

Standard Tools	Materials
General mechanics tool kit	Adhesive, Item 3, Appendix E
Personnel - 4	Sealing Compound, Item 19, Appendix E

DISASSEMBLY



NOTE
Letters locate detail views described in following procedures.

4-23. (cont)

1. Remove bolts (1), screws (2), nuts (3), lockwashers (4), and washers (5), securing lower mobilizer fitting (6) and spacer (7) to support channel (8).

2. Remove bolts (9), nuts (10), lockwashers (11), and washers (12) securing brackets (13) to base frame (14).

CLEANING, INSPECTION

1. Clean panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components

   b. Corrosion or paint damage.

REPAIR

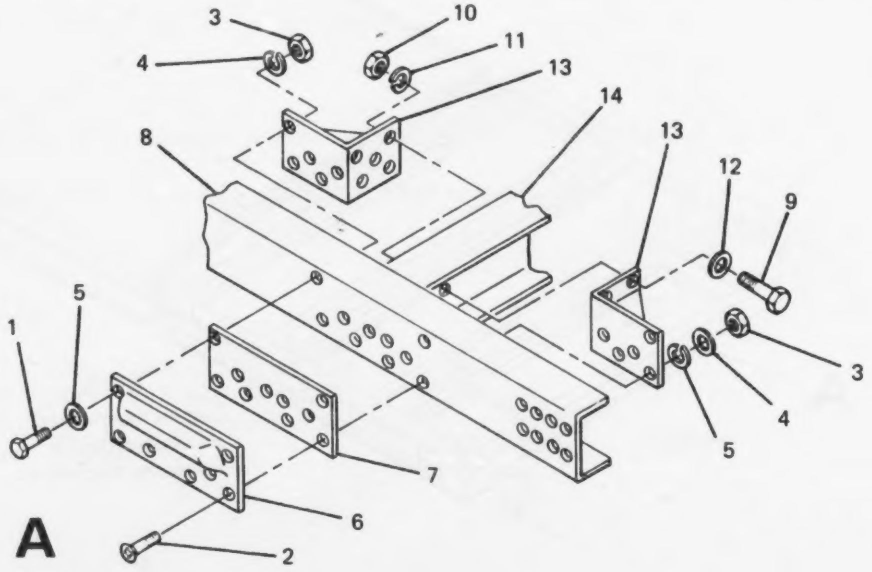
1. Panel skin damage (Refer to paragraphs 4-25 through 4-36.)

2. Corrosion or paint damage. (Refer to 4-37.)

ASSEMBLY

1. Position brackets (13) on base frame (14) and install bolts (9), washers (12), lockwashers (11), and nuts (10).

2. Position spacer (7) and lower mobilizer fitting (6) on base support channel (8) and install screws (2), bolts (1), washers (5), lockwashers (4), and nuts (3).



4-24. EQUIPMENT CONTAINER

This task covers:

a. Removal	c. Repair
b. Cleaning, Inspection	d. Installation

INITIAL SETUP

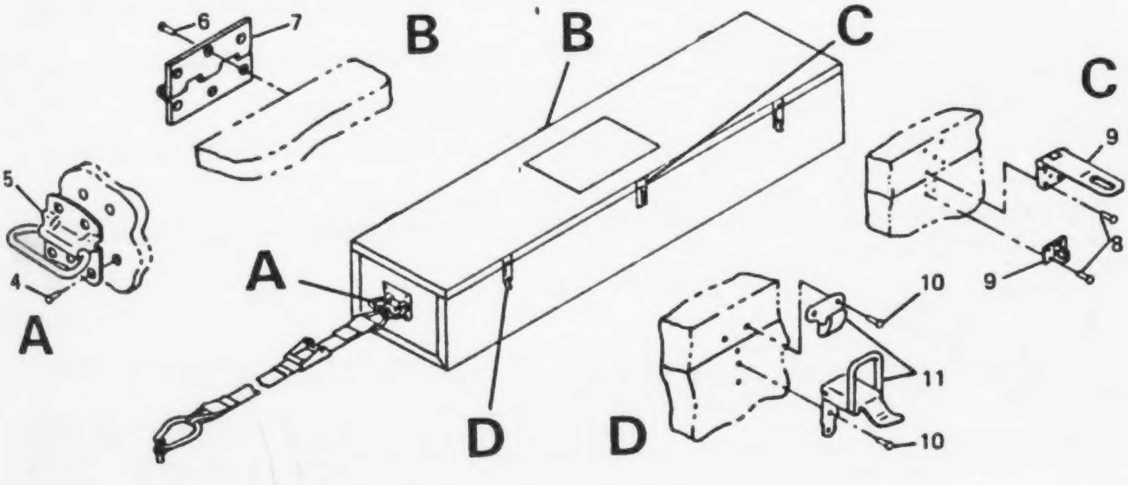
Special tools
Hand blind riveter, Appendix B, Item 2

Standard Tools
General mechanics tool kit

Personnel - 2

REMOVAL

1. Unscrew two tie-down rings (1) at the end of two strap assemblies (2) from floor panel.
2. Lift equipment container (3) from floor and remove from shelter.
3. Remove rivets (4) and chest handles (5). (Refer to 4-26.)
4. Remove rivets (6) and hinges (7). (Refer to 4-26.)
5. Remove rivets (8) and safety hasp (9). (Refer to 4-26.)
6. Remove rivets (10) and draw pull catches (11). (Refer to 4-26.)



CLEANING, INSPECTION

1. Wipe equipment container and component surfaces.
2. Inspect mounting surfaces for corrosion and damage.

4-24. (cont)

3. Inspect for and replace if necessary:
    a. Missing or damaged components.
    b. Corrosion or paint damage.

REPAIR

1. Corrosion or paint damage (Refer to 4-37.)
2. Replace damaged tie-down ring or strap assembly.

INSTALLATION

1. Position draw pull catches (11) on equipment container (3) and secure with rivets (10). (Refer to 4-26.)
2. Position safety hasp (9) on equipment container (3) and secure with rivets (8). (Refer to 4-26.)
3. Position hinges (7) on equipment container (3) and secure with rivets (6). (Refer to 4-26.)
4. Position chest handles (5) on equipment container (3) and secure with rivets (4). (Refer to 4-26.)
5. Position equipment container (3) on floor panel.
6. Install two tie-down rings (1) at the end of two strap assemblies (2) in holes in floor panel to secure equipment container (3) to floor.

Section V. COMMON REPAIRS

The procedures in paragraph 4-25 through 4-37 are common repairs and apply for all panel surfaces.

4-25. DRYING WATER-SOAKED AREAS IN PANELS

a. Care shall be taken to prevent water from entering panel core material, since it is very difficult to remove. When damage occurs, the punctured panel skin shall be temporarily protected with masking tape (Appendix E, Item 22) to prevent entry of water until repair can be made. If water has been allowed to enter panel, the core material shall be dried prior to skin repair.

b. Position heat lamps (Appendix B, Item 15) around damaged area. Adjust lamps so that panel surface temperature does not exceed 200°F (93.3°C).

4-25. (cont)

c. Allow heat lamps to remain in position until core material surrounding damaged area is thoroughly dry.

NOTE

Drying time will vary and is determined by experience and amount of moisture in panel. Core material will feel hard and brittle when dry.

d. After core material is thoroughly dried, repair panel in accordance with the applicable repair task.

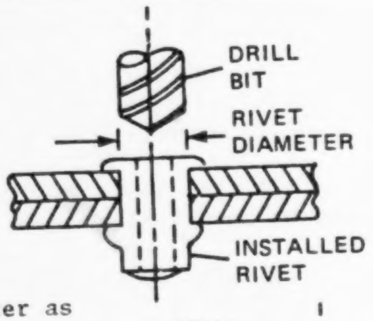
4-26. BLIND RIVET REMOVAL AND INSTALLATION

---

a. Remove blind rivets as follows:

WARNING

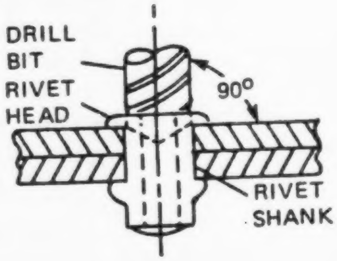
Wear safety goggles for eye protection from flying metal chips.


DRILL BIT
RIVET DIAMETER
INSTALLED RIVET

(1) Select drill bit the same diameter as installed blind rivet.

(2) Install selected drill bit in hand drill chuck.

(3) Hold drill perpendicular to the surface to prevent enlargement or damage to existing hole.


DRILL BIT
RIVET HEAD
90°
RIVET SHANK

(4) Drill through center of rivet just deep enough to sever rivet head from shank.

(5) Remove remainder of rivet with a pin punch.

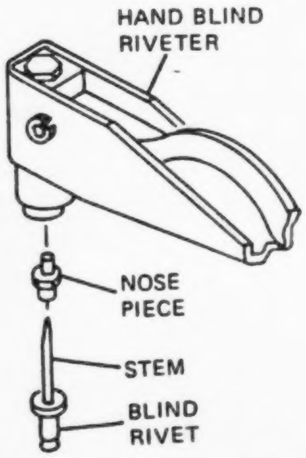
(6) Deburr rivet hole.

b. Install blind rivets as follows:

(1) Select proper diameter and length of blind rivet (Items 13-16, Appendix E).

(2) Select appropriate nose piece for hand blind riveter and install nose piece.

(3) Wet rivet with sealant (Item 18, Appendix E) and insert rivet in hole.


HAND BLIND RIVETER
NOSE PIECE
STEM
BLIND RIVET

4-26. (cont)

(4) Holding hand blind riveter at right angle to work, install on blind rivet stem.

(5) Push against work with just enough force to firmly seat rivet and prevent part separation.

(6) Actuate and pull rivet until stem breaks.

(7) Trim broken stem flush with rivet head.

(8) Firmly press on installed rivet to check tightness of installation.

(9) Remove and replace in accordance with procedure if installation is unacceptable.

c. Blind bolt removal.

(1) The blind bolt (BP-T & B100-T) can be removed by using the proper size blind bolt removal tool kit and any portable electric drill with a rated speed of no more than 1250 RPM.

(2) The tools in this kit are illustrated on page 4-94, and are tabulated on page 4-94.

(3) The fastener removal consists of four operations:

(a) Operation I - Drill pin. (See page 4-96)

(b) Operation II - Knock out drilled pin and remove upper portion of pin and lock collar. (See page 4-97)

(c) Operation III - Counterbore sleeve. (See page 4-98)

(d) Operation IV - Knock out counterbored sleeve and remove head of sleeve. (See page 4-99.)

NOTE

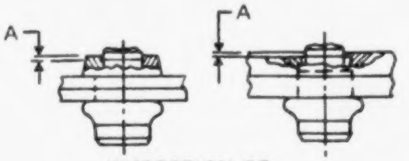
The illustration of the operations for removal show a countersunk blind bolt. The removal of a protruding head blind bolt is the same. A micro-limit tool is used with the counterbore cutter in Operation III to control the depth of the cut.

4-26. (cont)

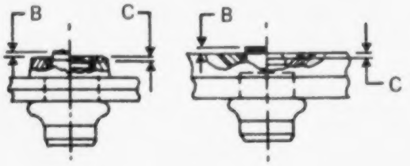
TABLE I

VISUAL INSPECTION TABLE

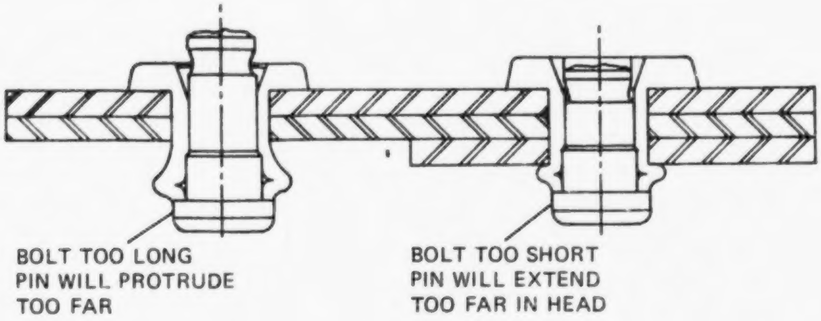
Rivet Dia.	Collar Position "A" max.	Lock Position "B" max. above	Lock Position "C" max. below	Minimum Blind Head Diameter
3/16"	.022"	.012"	.012"	.238"
1/4"	.029"	.015"	.015"	.315"



INSPECTION OF LOCKING COLLAR POSITION



INSPECTION OF PIN POSITION

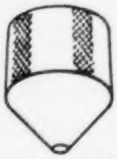

BOLT TOO LONG
PIN WILL PROTRUDE
TOO FAR
BOLT TOO SHORT
PIN WILL EXTEND
TOO FAR IN HEAD

A - Maximum allowable distance of locking collar above or below fastener head.
B - Maximum allowable distance of top of land on pin above fastener head.
C - Maximum allowable distance of top of land on pin below fastener head.

Blind Bolt Removal Tool Kits

Fasteners	Nom. Size	Kit No.
BP-T6, B100-T6	3/16"	105-60
BP-T8, B100-T8	1/4"	105-80

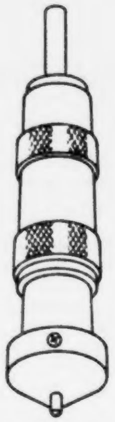
4-26. (cont)



DRILL BUSHING
(REF. NO. 1)

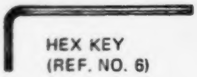
DRILLS
(REF. NO. 2)

PIN PUNCH
(REF. NO. 3)



MICRO-LIMIT
TOOL ASSEMBLY
(REF. NO. 4)

SLEEVE PUNCH
(REF. NO. 5)

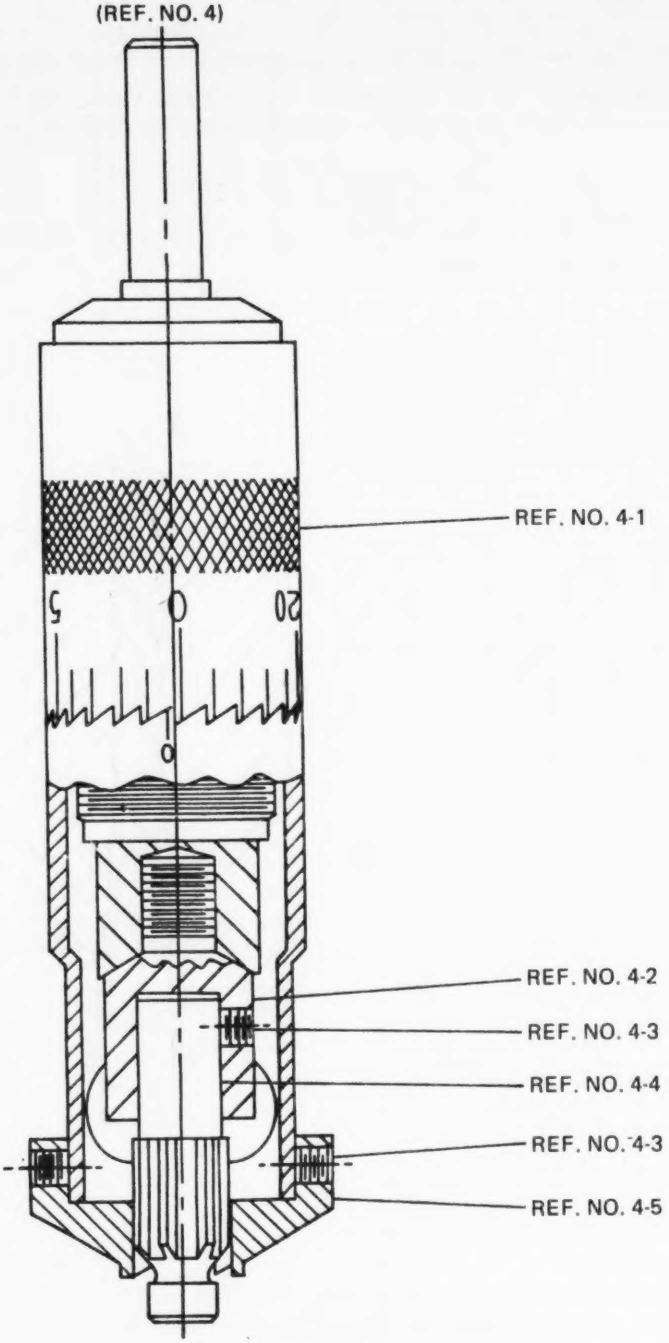


HEX KEY
(REF. NO. 6)

COMPOSITE PARTS LIST

Ref. No.	Description	105-60 Part No.	105-60 Req.	105-80 Part No.	105-80 Req.
4	Micro-Limit Tool Assembly	103601	1	103602	1
4-1	Micro-Limit Tool	103623	1	103623	1
4-2	Cutter Holder	110672-6	1	110672-6	1
4-3	Set Screw	501775	3	501775	3
4-4	Cutter	103606	1	103607	1
4-5	Anti-Rotation	103620	1	103621	1
3	Pin Punch	503010	1	503012	1
5	Sleeve Punch	503013	1	503015	1
2	Drill	503000	3	503001	3
1	Drill Bushing	103616	1	103617	1
6	Hex Key	502443	1	502443	1
	Case	103567	1	103567	1

4-26. (cont)


(REF. NO. 4)
REF. NO. 4-1
5
0
20
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REF. NO. 4-2
REF. NO. 4-3
REF. NO. 4-4
REF. NO. 4-3
REF. NO. 4-5

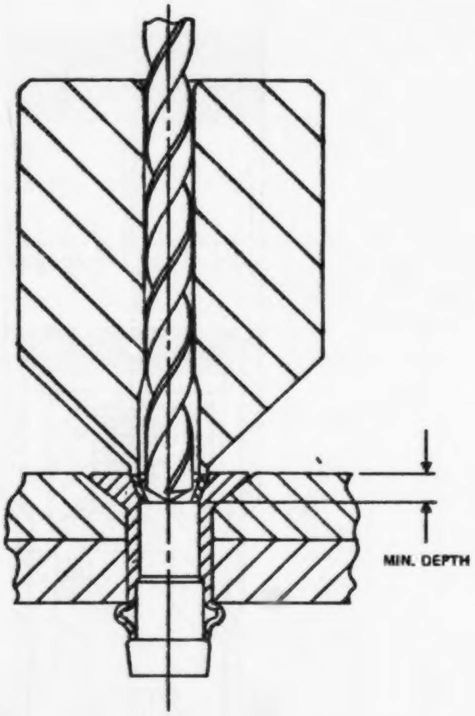
Micro-Limit Tool Assembly

4-26. (cont)

Drill

Nom. Size	Drill	Size	Min. Depth*	Bushing
3/16"	503000	.1200	.070	103616
1/4"	503001	.1562	.090	103617

* MAX. Depth + .020



d. Operation I - Drill Pin

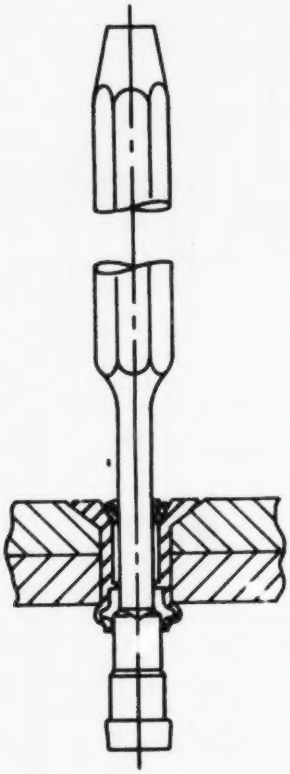
(1) Place the drill bushing over the pin so that it rests squarely on the lock collar.

(2) Using a drill with a maximum of 1250 RPM, drill to lock collar depth.

4-26. (cont)

Pin Punch

Nom. Size	Part No.	Size
3/16"	503010	3/32"
1/4"	503012	3/32"

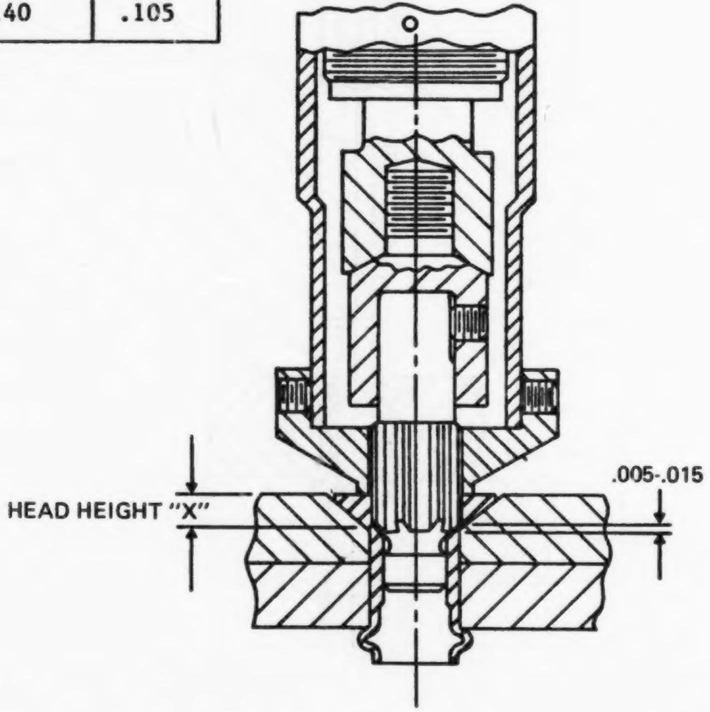


e. Operation II - Knock Out Pin
(1) Position pin punch on the fastener and drive fastener pin out.
(2) Remove remaining portion of pin and lock collar with any sharp pointed instrument.

4-26. (cont)

			Cutter	
Nom.Size	Holder	Cutter	Size	Anti-Rotation Cap
3/16"	103611	103606	3/16"	103620
1/4"	103611	103607	1/4"	103621

Head Height		
Protruding Head		C/Sunk Head
3/16"	.135	.080
1/4"	.140	.105



f. Operation III - Counterbore Sleeve

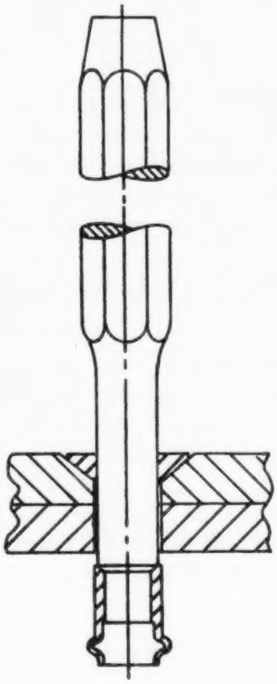
(1) Adjust micro-limit tool to within .005 to .015 less than dimension "X".

(2) Place anti-rotation cap firmly against head of fastener.
(3) Counterbore to desired depth.

4-26. (cont)

Sleeve Punch

Nom. Size	Part No.	Size
3/16"	503013	3/16"
1/4"	503015	1/4"



g. Operation IV - Knock Out Sleeve

(1) Position the sleeve punch in the sleeve and drive out lower portion of the sleeve.

(2) Tip the sleeve punch slightly and lift out the head of the fastener.

h. Tool Selection and Single Action Installation Sequence

NOTE

3/16" Fasteners are color identified green on pintail, shear cap or shear flange.

4-26. (cont)

SINGLE ACTION FASTENERS	DIA. DASH No.	NOM. DIA.	INSTALLATION TOOL SINGLE ACTION	NOSE ASSEMBLY SINGLE ACTION
MS90353S (SB100-T) MS90354S (SBP-T) SB100-EU & SBP-EU OSB100-T & OSBP-T	06	3/16	115	99-681
MS90353 (B100-T) MS90354 (BP-T) MS21140 (B 100-EU) MS21141 (BP-EU OB 100-T OBP-T	08	1/4	115	99-591

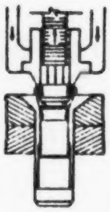
(1) During the initial part of the driving operation, the sleeve is squeezed between the head of the pin and the nose of the rivet tool.

(2) The head of the pin upsets the sleeve to form a strong, bulbed head on the blind side.

(3) When the blind head has been formed, the tool automatically forces the locking collar (at the pintail end of the sleeve) into the conical space between the recess in the head and the locking groove in the pin. This locks the parts together permanently.

(4) Pin is broken off in tension at the breakneck groove, substantially flush with the head of the sleeve. There is no projecting pin left to be cut off in a separate operation.

1



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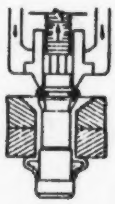
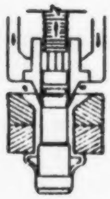
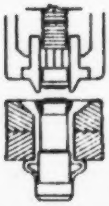


3



4



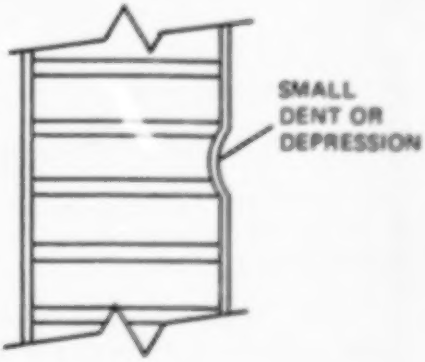
4-27. REPAIR OF SMALL DENT OR DEPRESSION

NOTE

The following procedure covers repair of small dents or depressions in any shelter panel skin (damaged area not exceeding 2 square in. (12.9 sq. cm) or 0.25 in. 6.4 mm) deep and no evidence of delamination).

WARNING

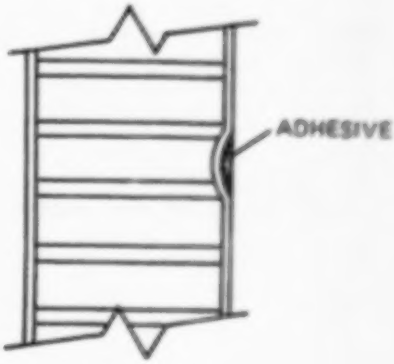
Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from all sparks or open flame. Gloves should be worn during use.



a. Remove all traces of paint from damaged area with sandpaper (Item 17, Appendix E).

b. Wipe sanded surface with clean cloth (Item 5, Appendix E) dampened in solvent (Item 20, Appendix E) and immediately wipe solvent from surface with a clean, dry cloth.

c. Mask sanded surface with masking tape (Item 22, Appendix E).



d. Mix small quantity of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions.

e. Using spatula or putty knife, fill damaged area with adhesive.

f. Apply heat using tripod base heat lamp, Appendix B, Item 15, at 200° F (93.3°C) for 40 to 60 minutes to fully cure adhesive. Alternate cures: 150° F for 4 hours or 75° F for 72 hours.

g. Sand surface of cured adhesive to conform to surrounding area.

h. Remove masking tape and clean repaired surface.

i. Refinish in accordance with paragraph 4-37.

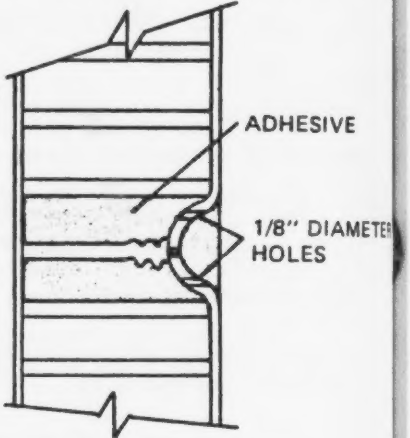
4-28. REPAIR OF DEPRESSION OR SMALL PUNCTURE

NOTE

The following procedure covers repair of a depression or small puncture in any shelter panel skin (depression exceeding 2 square in. (12.9 sq cm) or deeper than 0.25 in. (6.4 mm) but not larger than 4 square in. (25.8 sq cm) or puncture not larger than 1 square in. (6.5 sq cm)).

WARNING

Wear safety goggles for eye protection from flying metal chips.



a. Drill two 1/8 in. (3.18 mm) diameter holes within damaged area.

b. Dry panel per paragraph 4-25, if required.

c. Mix small quantity of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions.

d. Transfer adhesive to caulking gun and inject adhesive through two drilled holes to fill core cells completely.

e. Apply heat using tripod base heat lamp, Appendix B, Item 15, at 200°F (93.3°C) for 40 to 60 minutes to fully cure adhesive. Alternate cures: 150° F for 4 hours or 75° F for 72 hours.

f. Check by tapping damaged area to ensure complete filling of cells.

g. Sand damaged area with sandpaper (Item 17, Appendix E) to remove all traces of paint and excess adhesive.

WARNING

Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from all sparks or open flame. Gloves should be worn during use.

4-28. (cont)

h. Wipe sanded surface with clean cloth (Item 5, Appendix E) dampened in solvent (Item 20, Appendix E) and immediately wipe solvent from surface with a clean, dry cloth.

i. Mask sanded surface with masking tape (Item 22, Appendix E).

j. Mix small quantity of adhesive in accordance with manufacturer's instructions.

k. Using spatula or putty knife, fill damaged area with adhesive.

l. Apply external heat source at 200°F (93.3°C) for 40 to 60 minutes to fully cure adhesive.

m. Sand surface of cured adhesive to conform to surrounding area.

n. Remove masking tape and clean repaired surface.

o. Refinish in accordance with section 4-37.

4-29. REPAIR OF PUNCTURE WITH MINIMAL DAMAGE TO CORE

NOTE

> The following procedure covers repair of puncture in any shelter panel skin with minimal core damage, (damaged area not exceeding 14 square in. (90.3 sq cm)). Use hand router to cut patches and openings.

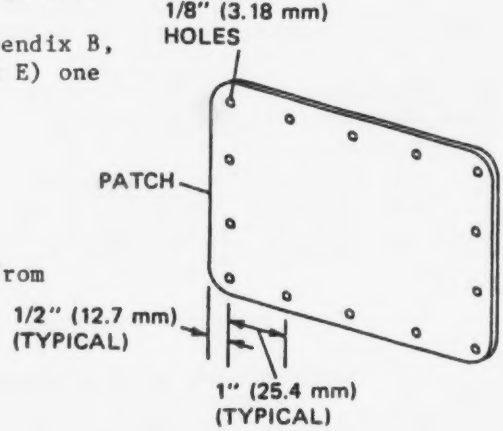
a. Dry panel per paragraph 4-25, if required.

b. Using portable electric router, Appendix B, Item 14, cut aluminum patch (Item 4, Appendix E) one inch larger all around than damaged area.

WARNING

> Wear safety goggles for eye protection from flying metal chips.

c. Layout and drill holes as shown.



d. Center patch over damaged area and mark patch outline on panel skin.

4-29. (cont)

e. Sand all paint from damaged panel skin within marked area, with sandpaper (Item 17, Appendix E).

f. Center patch over damaged area and drill No. 30 diameter holes in panel skin. Use holes in patch as a template.

g. Index patch and panel skin with a mark to allow patch to be replaced in same orientation.

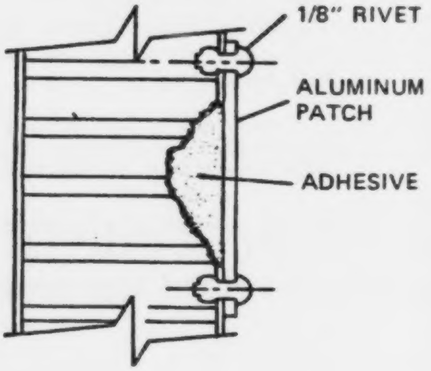
h. Deburr all drill holes.

WARNING

Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from all sparks or open flame. Gloves should be worn during use.

i. Wipe damaged area and patch with a clean cloth (Item 5, Appendix E) dampened in solvent (Item 20, Appendix E) and immediately wipe solvent from surfaces with a clean, dry cloth. Do not allow solvent to get into exposed core.

j. Mix sufficient amount of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions.



k. Pack adhesive in puncture and all exposed core cells. Use mixing sticks (Item 21, Appendix E) to pack adhesive and obtain a smooth surface.

l. Apply a thick film of remaining adhesive to mating surface of patch.

m. Place patch over prepared area in same orientation used in step f.

n. Align holes and, using hand blind riveter, install 1/8 in. (3.18 mm) diameter blind rivets (Items 15-16, Appendix E). (Refer to paragraph 4-26.)

o. Clean repaired surface.

p. Caulk around patch. (Refer to paragraph 4-36.)

q. Refinish in accordance with paragraph 4-37.

4-30. REPAIR OF PUNCTURE WITH CORE FRACTURE

NOTE

The following procedure covers repair of any shelter panel punctured skin with core fracture, (damaged area not exceeding 25 square in. (161 sq cm)). Use hand router to cut patches and openings.

WARNING

Wear safety goggles for eye protection from flying metal chips.

a. Dry panel per paragraph 4-25, if required.

b. Cut an opening through panel skin with a portable electric router, Appendix B, Item 14, that is one inch greater than damaged area. Avoid sharp corners in opening.

c. Peel damaged portion of skin from core by lifting and rolling skin.

d. Remove all loose core from exposed core area with compressed air.

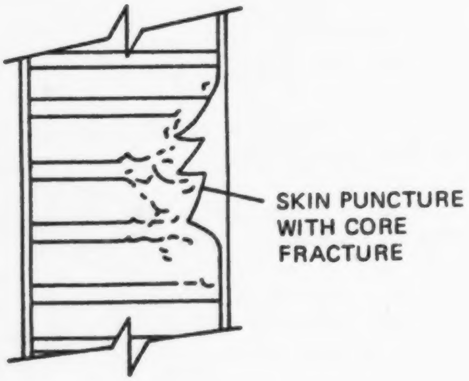
e. Cut aluminum patch (Item 4, Appendix E) one inch larger all around than cutout opening.

f. Layout and drill holes as shown.

g. Mix sufficient amount of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions.

h. Pack adhesive in core cells to fill exposed area above surface of panel skin.

i. Apply heat using tripod base heat lamp, Appendix B, Item 15, at 200°F (93.3°C) for 40 to 60 minutes to fully cure adhesive. Alternate cures: 150° F for 4 hours or 75° F for 72 hours.



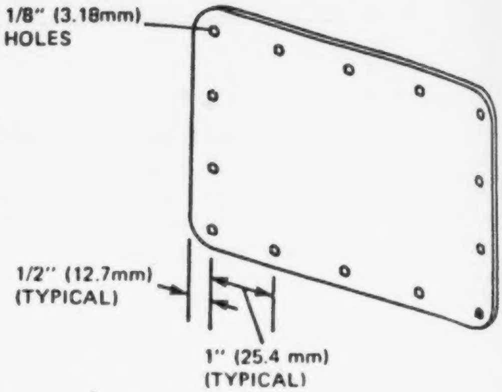
4-30. (cont)

j. Sand cured adhesive with sandpaper (Item 17, Appendix E) to obtain a smooth contour with surface of panel skin.

k. Center patch over adhesive-filled area and mark patch outline on panel skin.

l. Sand all paint from damaged panel skin within marked area.

m. Center patch over filled area and drill No. 30 diameter holes in panel skin. Use holes in patch as a template.



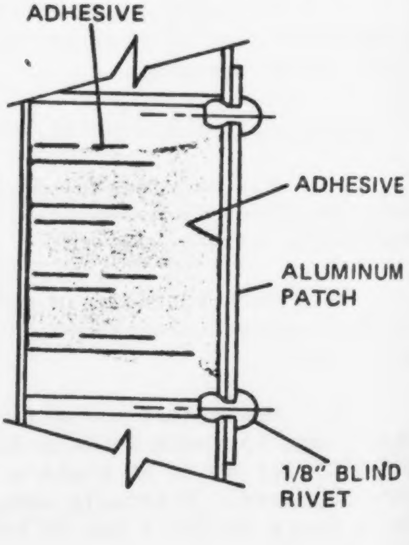
n. Index patch and panel skin with a mark to allow patch to be replaced in same orientation.

o. Deburr all drill holes.

WARNING

> Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from all sparks or open flame.

p. Wipe damaged area and patch with a clean cloth (Item 5, Appendix E) dampened in solvent (Item 20, Appendix E) and immediately wipe solvent from surfaces with a clean, dry cloth.



q. Mix sufficient amount of adhesive in accordance with manufacturer's instructions to coat one side of patch.

r. Apply a thick film of adhesive to mating surface of patch.

s. Place patch over prepared area in same orientation used in step k.

t. Align holes and, using hand blind riveter, install 1/8 in. (3.18 mm) diameter blind rivets (Items 15-16, Appendix E). (Refer to paragraph 4-26.)

u. Clean repaired surface.

v. Caulk around repair patch. (Refer to paragraph 4-36.)

w. Refinish in accordance with paragraph 4-37.

4-31. REPAIR OF DAMAGE WITH EXTENDED CRACKS

NOTE

> The following procedure covers repair of extended cracks (such as a long cut) in panel skin (damaged area does not exceed 36 in. (91.44 cm) square).

a. Dry panel per paragraph 4-25, if required.

b. Using portable electric router, Appendix B, Item 14, cut aluminum patch (Item 4, Appendix E) one inch larger all around than damaged area.

WARNING

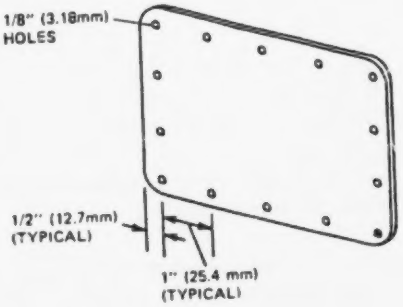
> Wear safety goggles for eye protection from flying metal chips.

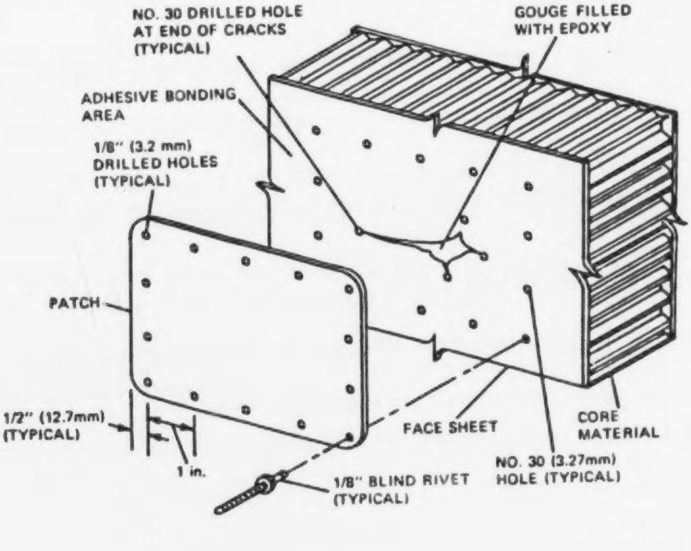
c. Layout and drill 1/8 in. (3.18 mm) holes as shown.

d. Stop-drill all cracks with No. 30 (3.27 mm) drill bit.

e. Center patch over damaged area and mark patch outline on panel skin.

f. Sand all paint from damaged skin within marked area with sandpaper (Item 17, Appendix E).


1/8" (3.18mm) HOLES
1/2" (12.7mm) (TYPICAL)
1" (25.4 mm) (TYPICAL)


NO. 30 DRILLED HOLE AT END OF CRACKS (TYPICAL)
GOUGE FILLED WITH EPOXY
ADHESIVE BONDING AREA
1/8" (3.2 mm) DRILLED HOLES (TYPICAL)
PATCH
1/2" (12.7mm) (TYPICAL)
1 in.
FACE SHEET
CORE MATERIAL
NO. 30 (3.27mm) HOLE (TYPICAL)
1/8" BLIND RIVET (TYPICAL)

g. Center patch over damaged area and drill No. 30 diameter holes in panel skin. Use holes in patch as a template.

h. Index patch and panel skin with a mark to allow patch to be replaced in same orientation.

i. Deburr all drill holes.

WARNING

Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from all sparks or open flame.

j. Wipe damaged area and patch with a clean cloth (Item 5, Appendix E) dampened in solvent (Item 20, Appendix E) and immediately wipe solvent from surfaces with a clean, dry cloth.

k. Mix sufficient amount of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions.

l. Pack adhesive in core cells to fill exposed area above surface of panel skin.

m. Apply heat using tripod base heat lamp, Appendix B, item 15, at 200°F (93.3°C) for 40 to 60 minutes to fully cure adhesive. Alternate cures: 150° F for 4 hours or 75° F for 72 hours.

n. Sand cured adhesive with sandpaper to obtain a smooth contour with surface of panel skin.

o. Wipe sanded area and patch with a clean cloth dampened in solvent and immediately wipe solvent from surfaces with a clean, dry cloth.

p. Mix sufficient amount of adhesive in accordance with manufacturer's instructions to coat one side of patch.

q. Apply a thick film of adhesive to mating surface of patch.

r. Place patch over prepared area in same orientation used in step g.

s. Align holes and using hand blind riveter (Appendix B, item 2), install 1/8 in. (3.18 mm) diameter blind rivets (Items 15-16, Appendix E). (Refer to paragraph 4-26.)

t. Clean repaired surface.

u. Caulk around repair patch. (Refer to paragraph 4-36.)

v. Refinish in accordance with paragraph 4-37.

4-32. REPAIR OF PUNCTURE THROUGH ONE SKIN AND CORE

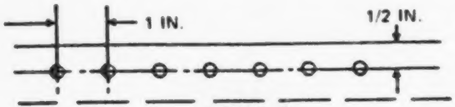
NOTE

The following procedure covers repair of panel puncture through one skin with core damage, (damaged area does not exceed 100 square in. (645 sq. cm)).

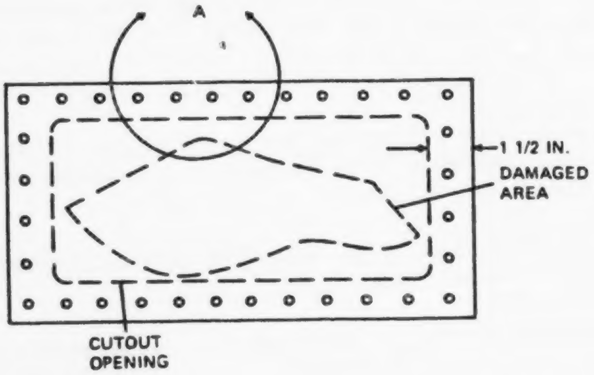
a. Cut an opening through panel skin with portable electric router, Appendix B, Item 14, that is one inch greater than damaged area. Avoid sharp corners in opening.

NOTE

Openings may be oval, circular, square, or rectangular with rounded corners.



DETAIL A



b. Peel damaged portion of skin from core by lifting and rolling skin.

c. Trim core area with a knife to same size as opening while leaving small amount of core material on opposite skin.

d. Cut aluminum patch 1 1/2 inch (3.8 cm) (Item 4, Appendix E) larger all around than cutout opening.

e. Layout and drill 1/8 inch (3.18 mm) diameter holes in patch. (See Detail A.)

4-32. (cont)

f. Cut core material (Items 7-10, Appendix E) same size as cutout opening. Core plug should be flush with or slightly lower than panel skin surface.

g. Center patch over cutout opening and mark patch outline on panel skin.

h. Drill No. 30 diameter holes in panel skin with patch as template.

i. Sand all paint from panel skin within marked area with sandpaper (Item 17, Appendix E).

j. Index patch and panel skin with a mark to allow patch to be replaced with same orientation.

k. Deburr drill holes and sand all paint from panel skin within marked area.

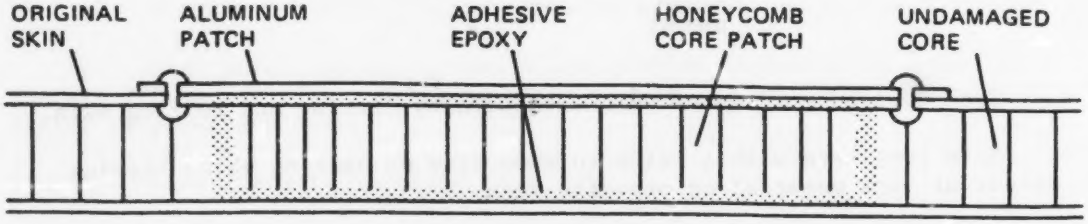
l. Clean loose core material, dust, and chips from cutout opening.

WARNING

> Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from sparks or open flame. Gloves should be worn during use.

m. Wipe panel skin within marked area and patch with a clean cloth (Item 5, Appendix E) dampened with solvent and immediately wipe solvent from surfaces with a clean, dry cloth.

n. Mix sufficient amount of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions.



o. Apply an even coat of adhesive to cutout core surfaces.

p. Insert core plug in cutout opening and press firmly in place.

q. Apply an even coat of adhesive around core plug and fill any gaps around plug.

4-32. (cont)

r. Apply heat using tripod base heat lamp (Appendix B, Item 15) at 200°F (93.3°C) for 40 to 60 minutes to fully cure adhesive. Alternate cures: 150° F (65.6°C) for 4 hours or 75° F (23.9°C) for 72 hours.

s. Sand cured adhesive with sandpaper to obtain a smooth contour with surface of panel skin.

t. Apply an even coat of adhesive to mating surface of patch.

u. Place patch over prepared area in same orientation as step j.

v. Align holes and using hand blind riveter (Appendix B item 2), install 1/8 inch (3.18 mm) diameter blind rivets (Items 15-16, Appendix E). (Refer to 4-26.)

w. Clean repaired surface.

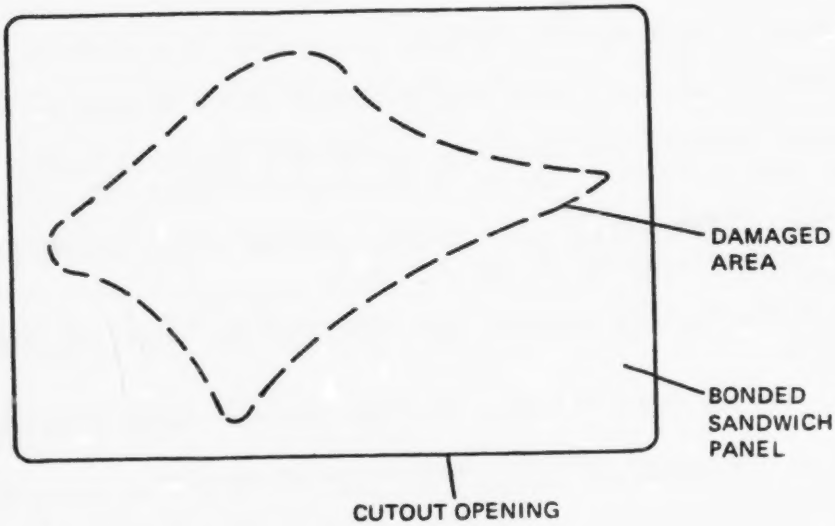
x. Caulk around repair patch. (Refer to 4-36.)

v. Refinish in accordance with 4-37.

4-33. REPAIR OF PUNCTURE THROUGH BOTH SKINS AND CORE

NOTE

The following procedures cover repair of panel puncture through both skins and core (damage area does not exceed 100 square in. (645 sq. cm)). Use hand router to cut patches and openings.



4-33. (cont)

a. Cut an opening through panel skin with portable electric router (Appendix B, Item 14) that is one inch greater than damaged area. Avoid sharp corners in opening.

NOTE

Openings may be oval, circular, square, or rectangular with rounded corners. Ensure core ribbon direction is same as panel. Dry panel per paragraph 4-25, if required.

b. Cut a core plug and two aluminum patches (Item 4, Appendix E) one to three inches larger all around than cutout opening.

c. Mix sufficient amount of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions to bond two patches to core plug.

WARNING

Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from sparks or open flame. Gloves should be worn during use.

d. Wipe patches with a clean cloth (Item 5, Appendix E) dampened with solvent and immediately wipe solvent (Item 20, Appendix E) from surfaces with a clean, dry cloth.

e. Apply a thick coat of adhesive to one side of each patch.

f. Place core plug between two patches to create a sandwich panel.

g. Apply pressure and heat using tripod base heat lamp (Appendix B, Item 15) at 200° F (93.9° C) for 40 to 60 minutes to fully cure adhesive.

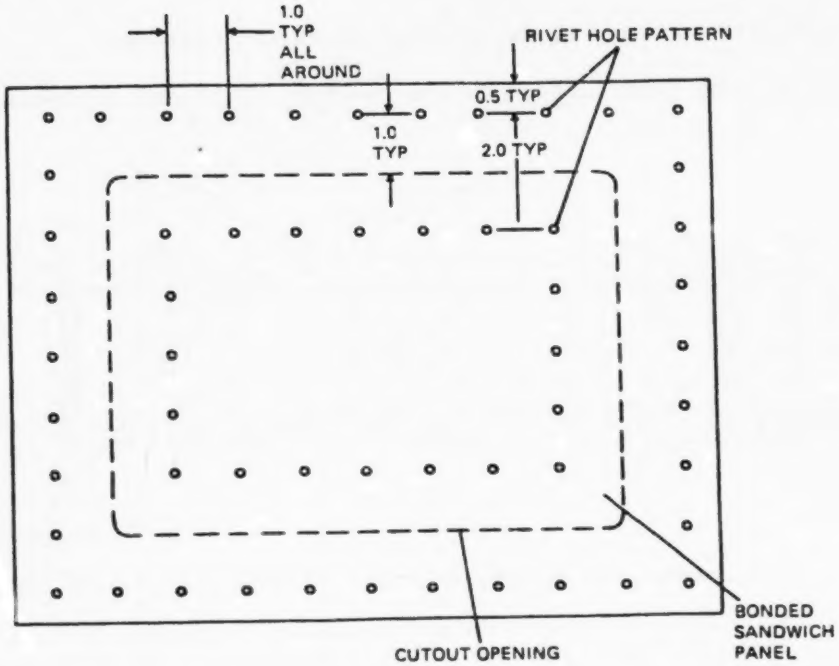
h. Cut bonded sandwich panel to same size as cutout opening (step a). Ensure core ribbon direction is same as panel.

i. Cut two aluminum patches 1 1/2 inch (3.8 cm) larger all around than cutout opening.

j. Layout and drill 1/8 inch (3.18 mm) diameter holes in patches.

k. Position bonded sandwich panel in cutout opening.

4-33. (cont)



l. Center patches, one on each side of panel, over cutout opening.

m. Drill No. 30 (3.27 mm) diameter holes in panel skins and bonded sandwich panel with patches as templates.

n. Mark each patch outline on panel skin, and sand all paint from panel skin within marked area with sandpaper (Item 17, Appendix E).

o. Index each patch and panel skin with a mark to allow patches to be replaced with same orientation.

p. Remove patches and bonded sandwich panel.

q. Deburr drill holes and sand all paint from panel skin within marked areas.

r. Clean loose core material, dust, and chips from cutout opening.

s. Wipe panel skin within marked areas, two patches, and bonded sandwich panel metal skin with a clean cloth dampened with solvent. Immediately wipe solvent from surfaces with a clean, dry cloth.

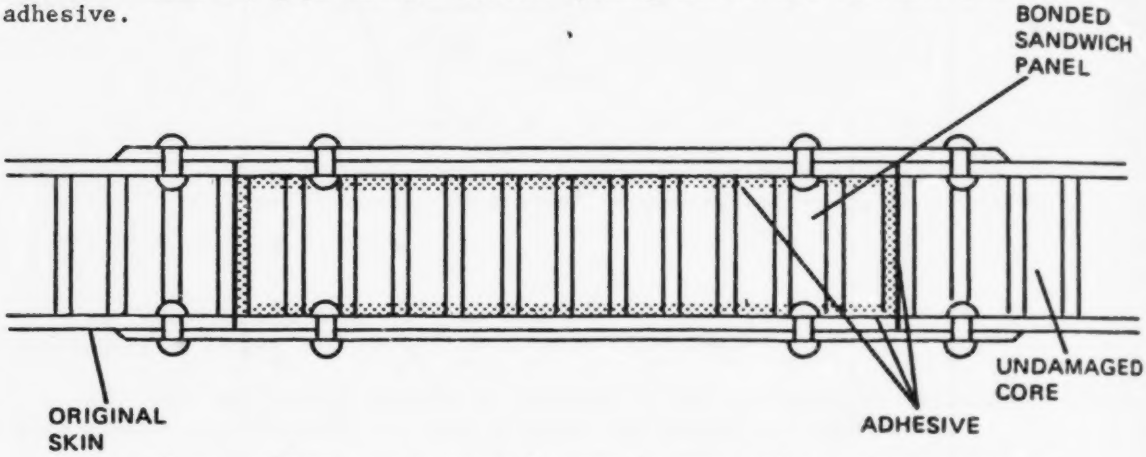
t. Mix sufficient amount of adhesive in accordance with manufacturer's instructions.

u. Apply a thick coat of adhesive to inside surfaces of panel cutout opening, bonded sandwich panel, and two patches.

4-33. (cont)

v. Position bonded sandwich panel in cutout opening.

w. Fill any gaps between cutout opening and bonded sandwich panel with adhesive.



x. Place patches over prepared areas in same orientation as step o.

y. Align holes and using hand blind riveter (Appendix B, item 2), install 1/8 inch (3.18 mm) diameter blind rivets (Items 15-16, Appendix E). (Refer to 4-26.)

z. Clean repaired surfaces.

aa. Caulk around repair patches. (Refer to 4-36.)

ab. Refinish in accordance with 4-37.

4-34. SHELTER BODY SEALS REPLACEMENT

WARNING

Wear safety goggles for eye protection from flying metal chips.

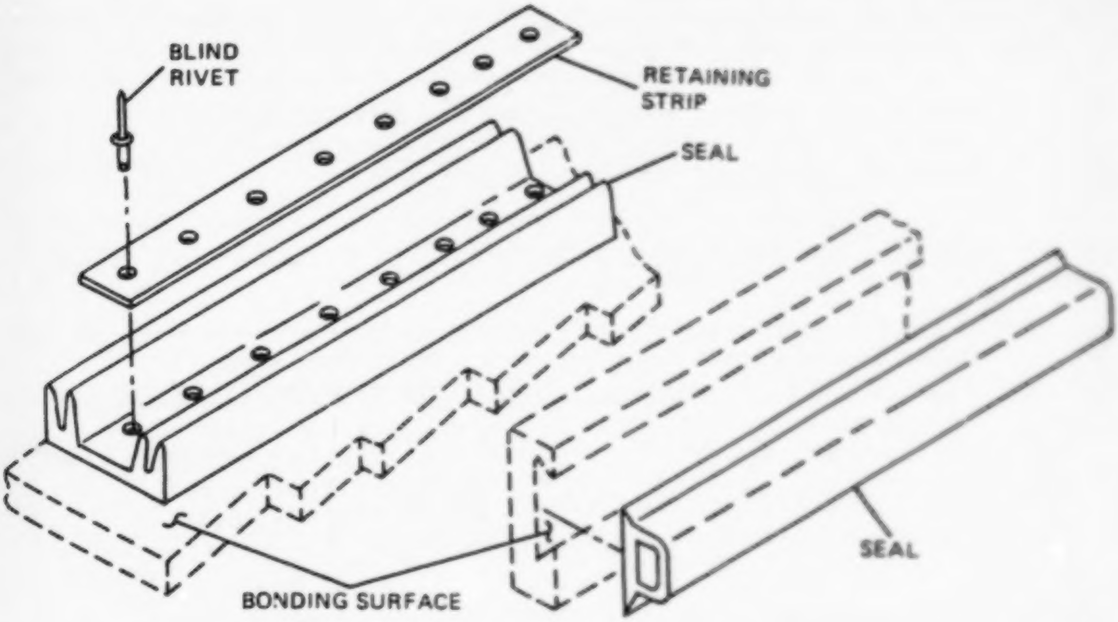
a. If defective seal has a retaining strip, drill out blind rivets and remove retaining strip. (Refer to paragraph 4-26.)

b. Remove defective seal and strip old sealant from bonding surface.

WARNING

Methylethylketone is flammable and toxic and shall be used only in a well-ventilated area away from all sparks or open flame.

4-34. (cont)



c. Sand using sandpaper (Item 17, Appendix E) only if required to remove material not taken off in preceding step.

d. Wipe bonding surface with a clean cloth (Item 5, Appendix E) dampened with solvent (Item 20, Appendix E) and immediately wipe solvent from surface with a clean, dry cloth.

CAUTION

> Seals shall not be washed with any aromatic hydrocarbon (such as benzene, toluene, or xylene) which will cause deterioration.

e. Clean seal with a lint-free cloth by dry wiping prior to bonding.

f. Brush sealant (Item 18, Appendix E) on mating surfaces of seal and bonding surface.

g. When sealant is tacky (approximately 5 minutes), place seal in position, press firmly to seat and ensure contact with mating surface.

h. If seal is the type that has a retaining strip, seal shall be bonded prior to riveting retaining strip. (Refer to paragraph 4-26 for blind rivet installation.)

i. After installing rivets, using hand blind riveter, cover rivets and seal with sealing compound (Item 19, Appendix E).

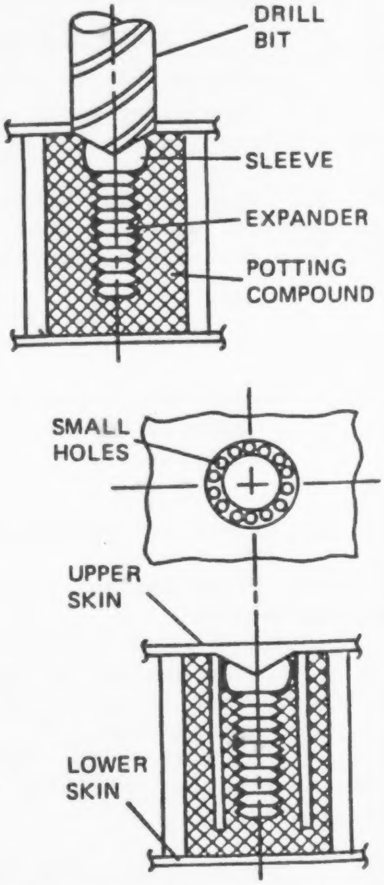
4-35. THREADED INSERTS REPLACEMENT

NOTE

Inserts installed in extrusions are not potted. For removal of these inserts, perform steps a and b only. Knock out insert and replace with same type.

a. Depending on insert size, select a drill bit in size range listed below.

Insert Thread Size	Drill Size Range inches (mm)
10-32	7/16-15/32 (11/12.4)
1/4-28	17/32-21/32 (13.5/16/7)
5/16-24	39/64-21/32 (15.5/16.7)
3/8-24	43/64-23/32 (17/18.3)



WARNING

Wear safety goggles for eye protection against flying chips.

b. Using selected drill bit, drill head flange from insert.

c. Drill small holes around insert body in potting compound to approximate depth of insert. Take care not to damage area around insert beyond hole diameter of step above. Do not drill through to opposite skin.

d. Install bolt of corresponding thread size in insert.

e. Use wrench to break insert loose.

f. Install bolt end in a hand drill motor.

g. Spin loose insert to build up heat which will allow insert to be removed from hole.

h. Remove loose chips and clean out hole.

NOTE

Replacement insert is a spool type potted insert.

4-35. (cont)

i. Depending on replacement insert size, select a drill bit from sizes listed below. After drilling small holes around periphery of insert, the remaining hole will be much larger than the recommended drill size.

Insert Thread Size	Insert Outside Diameter inches (mm)	Drill Size inches (mm)
1/4-28	0.437 (11.1)	29/64 ± 0.010 (11.5 ± 0.25)
5/16-24	0.500 (12.7)	33/64 ± 0.010 (13.1 ± 0.25)
10-32 & 3/8-16	0.562 (14.3)	37/64 ± 0.010 (14.7 ± 0.25)
1/4-28 & 5/16-24	0.687 (17.5)	45/64 ± 0.010 (17.9 ± 0.25)
3/8-24	0.750 (19.1)	49/64 ± 0.010 (19.5 ± 0.25)

j. Using selected drill bit, drill through panel skin to approximate depth of insert to be installed.

NOTE

Take care not to drill through opposite skin.

k. Install long end of Allen wrench into drill chuck and insert short end in predrilled hole and remove additional honeycomb core to one inch (2.54 mm) in diameter. Leave from 1/8 in. (3.2 mm) to 1/4 in. (6.4 mm) of core at bottom of hole.

l. Remove loose honeycomb and foam insulation, if applicable, from hole.

m. Degrease insert by cleaning with solvent (Item 20, Appendix E).

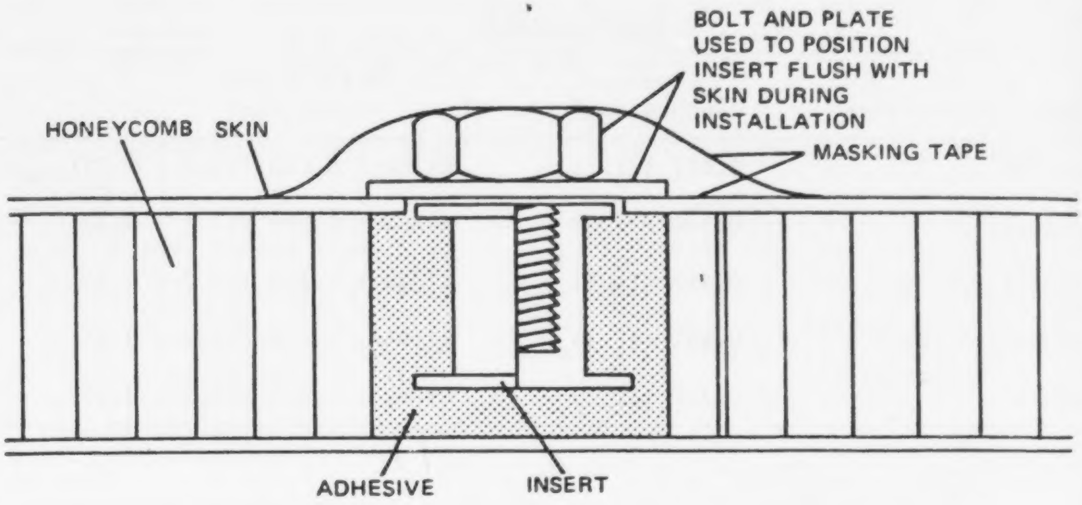
NOTE

After cleaning, handle insert with clean, white gloves (Item 11, Appendix E).

n. Mask skin area around hole with masking tape (Item 22, Appendix E) approximately 3" x 3".

4-35. (cont)

o. Prepare aluminum plate (Item 24, Appendix E) approximately 1/8 in. (3.2 mm) thick by 2 in. (50.8 mm) square with a center hole equal to bolt thread outer diameter (replacement insert thread size).


BOLT AND PLATE USED TO POSITION INSERT FLUSH WITH SKIN DURING INSTALLATION
HONEYCOMB
SKIN
MASKING TAPE
ADHESIVE
INSERT

p. Install bolt through plate and into insert. Hand-tighten insert against plate.

q. Mix sufficient amount of adhesive (Item 1, Appendix E) in accordance with manufacturer's instructions.

r. Fill prepared hole completely with mixed adhesive. Make sure there are no air pockets.

s. Force preassembled insert into filled hole with a threading motion until plate is flush against skin.

t. Remove excess adhesive (squeeze out) from work area.

u. Apply masking tape over bolt to maintain alignment during curing cycle.

v. Cure non-structural inserts for at least 4 hours at 75° F.

w. Inserts on which there is structural dependency should be cured at 75° F for 72 hours.

x. After cure, remove masking tape, bolt, and plate.

y. Clean skin as required. (Refer to Appendix E, Items 5 and 20.)

z. Refinish in accordance with paragraph 4-37.

4-35. (cont)

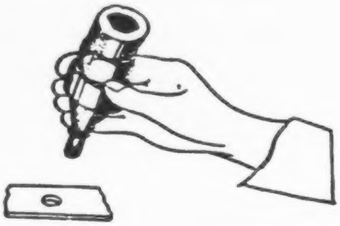
aa. Non-Potted Insert Manual Installation

(1) Select fastener header model (Appendix B, Item 7 or 8) applicable to insert to be installed.

(2) Lubricate header jackscrew threads with spray lubricant (Appendix E, Item 25).

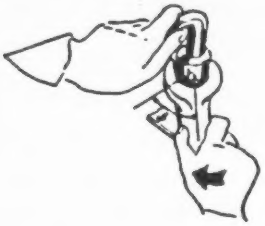
(3) Assemble sleeve and expander or one-piece insert on header pull-up stud to engage all threads on stud.

(4) Advance header anvil until it is tight on head of sleeve or one-piece insert.



(5) Position prepared assembly in hole.

(6) Place hex wrench (supplied with header) in socket of header jackscrew and place box-end or adjustable wrench (Appendix B, Item 9) on hex nut approximately 60° rotation from line of hex wrench.



NOTE

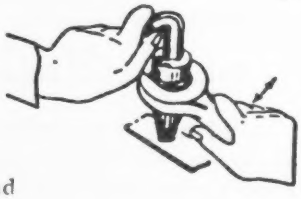
A box-end ratchet wrench is preferable as the pull on the expander or one-piece insert body should be made at a uniform rate and as quickly as possible.

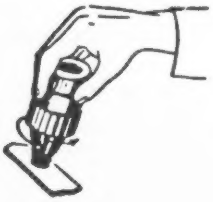
(7) Hold header perpendicular to plane of work. Hold jackscrew stationary with hex wrench. Turn hex nut in clockwise direction through 60° angle and repeat until firm resistence indicates complete upset of sleeve or one-piece insert body. Approximate number of turns required to upset is as follows:

Thread Size	Turns (Min Grip)	Turns (Max Grip)
10-32	1-3/4	1
1/4-28	2-1/4	1-1/2
5/16-24	2-3/4	1-3/4
3/8-24	2-1/4	1-1/2

(8) Break hex nut loose with counterclockwise rotation. Remove both wrenches from header.

(9) Remove header from installed insert by rotating entire header in counterclockwise direction.





4-36. CAULKING REPAIRED AREAS

a. Mix sufficient amount of sealing compound (Item 19, Appendix E) in accordance with manufacturer's instructions.

NOTE

Maximum application life of sealing compound is 2 hours.

b. Just prior to application of sealing compound, clean surface to be sealed with cloth (Item 5, Appendix E) dampened with solvent (Item 20, Appendix E).

c. Dry with a clean cloth before solvent evaporates in order to prevent contamination.

d. Apply sealing compound with caulking gun (or spatula) in 1/8 inch (3.18 mm) minimum fillets.

e. Nominal curing time is 72 hours at 75° F.

4-37. PAINT REFINISHING

PAINT DATA

Use	Type	Specification Color	Color Code FED STD 595
Interior Paint	Coating, Urethane Aliphatic Isocyanate	MIL-C-83286 Gloss White	17925
Exterior Paint	Coating, Aliphatic Polyurethane	MIL-C-46168 Sand	
Primer	Primer Coating, Epoxy Polyamide	MIL-P-23377	
Floor Primer	Primer, Zinc Chromate	TT-P-1757	
Floor Paint	Walkway Compound	MIL-W-5044 Type I Gray	26251

4-37. (cont)

NOTE

Paint data is also listed on color code identification plate on personnel endwall.

a. Prepare surface for painting by removing all corrosion by wire brushing, sanding, or application of corrosion-removing compounds.

b. Chemically treat all aluminum parts in accordance with MIL-C-5541. Class 1A.

c. Areas to be painted shall be free of dust, residue, and cleaning compounds before refinishing.

d. Solvent, primer, or paint shall not be applied to seals or non-metal parts. Mask such parts with masking tape for protection.

e. Mix and apply epoxy polyamide primer coating (Item 6, Appendix E) in accordance with MIL-C-22751.

f. Allow to dry thoroughly before applying finish coat.

g. Mix and apply paint in accordance with manufacturer's instructions.

h. Apply two separate, uniform coats. Make sure there are no sags or runs.

i. Allow first coat to dry before applying second coat.

4-38. DECAL REMOVAL AND REPLACEMENT

a. Use a putty knife (or similar tool) to peel decals off all surfaces.

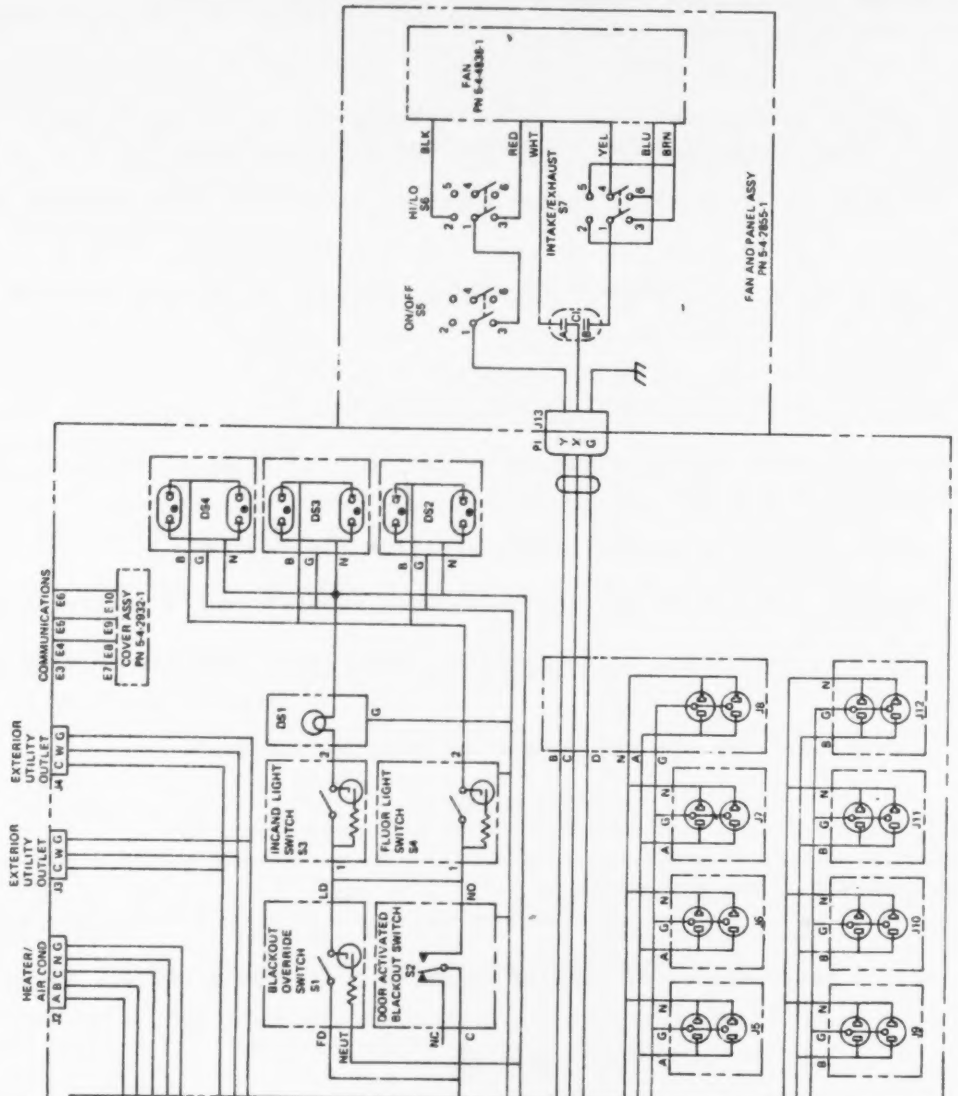
WARNING

Methylethylketone (MEK) is flammable and toxic and must be used only in a well-ventilated area away from all sparks or open flame. Gloves should be worn during use.

b. Clean all decal mounting surfaces. (Refer to Appendix E, Items 5 and 20.)

c. Remove protective liner from adhesive backing of decal and apply. Use hand pressure or squeegee to insure proper adhesion.

4-39. ELECTRICAL SYSTEM SCHEMATIC DIAGRAM


FAN
PN 5-4-4838-1
BLK
RED
WHT
YEL
BLU
BRN
HI/LO
S6
INTAKE/EXHAUST
S7
ON/OFF
S5
FAN AND PANEL ASSY
PN 5-4-2855-1
J13
P1
Y
X
G
DS4
DS3
DS2
B
G
N
COMMUNICATIONS
E3
E4
E5
E6
E7
E8
E9
E10
COVER ASSY
PN 5-4-2932-1
EXTERIOR UTILITY OUTLET
J4
C W G
EXTERIOR UTILITY OUTLET
J3
C W G
HEATER/ AIR COND
J2
A B C N G
DS1
INCAND LIGHT SWITCH
S3
FLUOR LIGHT SWITCH
S4
BLACKOUT OVERRIDE SWITCH
S1
DOOR ACTIVATED BLACKOUT SWITCH
S2
LD
NO
FD
NEUT
NC
C
J5
J6
J7
J8
J9
J10
J11
J12
GROUND STUD
E1
E2
CB1
40A
CB8
15A
CB6
15A
CB4
10A
CB3
20A
CB5
20A
MAIN CB
60A
SERVICE ENTRANCE
J1
G N C B A
PANELBOARD
120/208V AC 60HZ 3PH
4 WIRE WITH GROUND
PN 5-4-3149-1
GND
NEUT
A B C

4-40. WIRE LIST

Wire No	Inch Long	Size Awg And Color	From	To
W1-1	60	12 BLK	P1-Y	J8-B
W1-2	240	12 BLK	J8-B	CB4-B
W1-3	60	12 WHT	P1-X	J8-C
W1-4	240	12 WHT	J8-C	NEUT
W1-5	60	12 GRN	P1-G	J8-D
W1-6	240	12 GRN	J8-D	GND
W1-7	18	12 RED	E3	E7
W1-8	18	12 RED	E4	E8
W1-9	18	12 RED	E5	E9
W1-10	18	12 RED	E6	E10
W1-11	6	18 RED	J13-Y	S5-1
W1-12	6	18 RED	S5-3	S6-1
W1-13	6	18 RED	S7-2	S7-6
W1-14	6	18 RED	S7-5	S7-3
W1-15	6	18 WHT	J13-X	C1-A
W1-16	6	18 WHT	C1-B	S7-1
W1-17	6	18 GRN	J13-G	GND
		BLK	FAN	S6-2
		RED	FAN	S6-3
		WHT	FAN	C1-A
		YEL	FAN	S7-4
		BLU	FAN	S7-6
		BRN	FAN	S7-3
W2-1	8	12 RED	CB6-B	S1-FD
W2-2	88	12 RED	CB6-B	S2-C
W2-3	90	12 RED	S1-LD	S3-1
W2-4	87	12 RED	S2-NO	S1-LD
W2-5	27	12 RED	S2-NO	S4-1
W2-6	81	12 RED	S3-2	DS1
W2-7	184	12 RED	S4-2	DS2-B
W2-8	90	12 RED	DS2-B	DS3-B
W2-9	90	12 RED	DS3-B	DS4-B
W2-10	78	12 WHT	DS1	NEUT
W2-11	97	12 WHT	DS2-N	NEUT
W2-12	90	12 WHT	DS2-N	DS3-N
W2-13	90	12 WHT	DS3-N	DS4-N
W2-14	97	12 GRN	DS2-G	GND
W2-15	90	12 GRN	DS2-G	DS3-G
W2-16	90	12 GRN	DS3-G	DS4-G
W2-17	78	12 GRN	DS1-G	GND
W2-18	20	12 BLU	CB8-B	J3-C
W2-19	20	12 BLU	CB8-B	J4-C
W2-20	20	12 WHT	J3-W	NEUT
W2-21	20	12 WHT	J4-W	NEUT
W2-22	20	12 GRN	J3-G	GND

4-40. (cont)

Wire No	Inch Long	Size Awg And Color	From	To
W2-23	20	12 GRN	J4-G	GND
W2-24	30	12 WHT	S1-NEUT	NEUT
W2-25	10	12 BARE	S2-GND	DS1-BOX GND
W2-26	24	12 GRN	DS1-G	S4-BOX GND
W3-1	52	12 BLK	CB3-B	J5-A
W3-2	68	12 BLK	J5-A	J6-A
W3-3	68	12 BLK	J6-A	J7-A
W3-4	68	12 BLK	J7-A	J8-A
W3-5	52	12 WHT	J5-N	NEUT
W3-6	68	12 WHT	J5-N	J6-N
W3-7	68	12 WHT	J6-N	J7-N
W3-8	68	12 WHT	J7-N	J8-N
W3-9	52	12 GRN	J5-G	GND
W3-10	68	12 GRN	J5-G	J6-G
W3-11	6	12 BARE	J5-G	BOX GND
W3-12	68	12 GRN	J6-G	J7-G
W3-13	6	12 BARE	J6-G	BOX GND
W3-14	68	12 GRN	J7-G	J8-G
W3-15	6	12 BARE	J7-G	BOX GND
W3-16	6	12 BARE	J8-G	BOX GND
W3-17	123	12 RED	CB5-B	J9-B
W3-18	68	12 RED	J9-B	J10-B
W3-19	68	12 RED	J10-B	J11-B
W3-20	68	12 RED	J11-B	J12-B
W3-21	123	12 WHT	J9-N	NEUT
W3-22	68	12 WHT	J9-N	J10-N
W3-23	68	12 WHT	J10-N	J11-N
W3-24	68	12 WHT	J11-N	J12-N
W3-25	123	12 GRN	J9-G	GND
W3-26	68	12 GRN	J9-G	J10-G
W3-27	6	12 BARE	J9-G	BOX GND
W3-28	68	12 GRN	J10-G	J11-G
W3-29	6	12 BARE	J10-G	BOX GND
W3-30	68	12 GRN	J11-G	J12-G
W3-31	6	12 BARE	J11-G	BOX GND
W3-32	6	12 BARE	J12-G	BOX GND
W4-1	36	4 BLK	J1-A	MAIN CB-A
W4-2	36	4 RED	J1-B	MAIN CB-C
W4-3	36	4 BLU	J1-C	NAIN CB-E
W4-4	52	4 WHT	J1-N	NEUT
W4-5	36	6 GRN	J1-G	GND
W4-6	36	6 GRN	E1	E2
W5-1	36	4 BLK	J2-A	CB1-B
W5-2	36	4 RED	J2-B	CB1-D
W5-3	36	4 BLU	J2-C	CB1-F
W5-4	52	4 WHT	J2-N	NEUT
W5-5	36	6 GRN	J2-G	GND

Section VI. PREPARATION FOR STORAGE AND SHIPMENT

4-41. PREPARATION FOR STORAGE AND SHIPMENT

The following steps describe procedures for storing or shipping the shelter.

a. Inspection. Inspect the shelter for the following:

(1) Make sure all circuit breakers and switches in OFF position.

(2) Make sure circuit breaker panel door is closed.

(3) Make sure equipment container is strapped down to shelter floor.

(4) Make sure caps are secured on power entry panel receptacles and binding posts are tightened.

(5) Make sure all lights and jacks are secured in their stowage positions.

(6) Make sure all doors are securely closed.

b. Packing. Be sure all components are clean and dry before packing.

CAUTION

> Use care when transporting or storing shelter to prevent damage to shelter.

c. Care and Storage. Store shelter in a dry area or a designated supply facility. If stored outside in humid conditions, check quarterly for dampness inside the shelter.

CHAPTER 5

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

5-1. GENERAL. This chapter provides maintenance procedures for direct support personnel and consists of the following:

a. Fan assembly repair (paragraph 5-2).

b. Roof panel replacement (paragraph 5-3).

c. Corner post and ISO fitting assembly replacement and repair (paragraph 5-4).

5-2. FAN ASSEMBLY

This task covers:
a. Disassembly
b. Cleaning, Inspection
c. Repair
d. Assembly

INITIAL SETUP

Standard Tools
General mechanics tool kit
Electrical tool kit
Personnel
Electrician

Equipment Condition
Fan and panel assembly removed from shelter (4-15)
Materials
Adhesive, Item 2, Appendix E
Adhesive, Item 3, Appendix E
Sealing Compound, Item 19, Appendix E

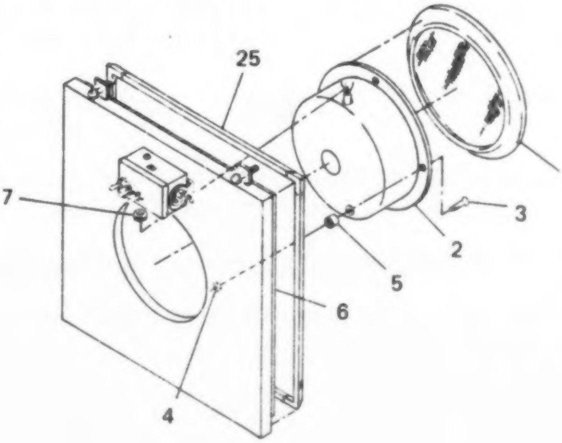
DISASSEMBLY

1. Remove fan cover (1) from fan housing (2).

NOTE

Tag wires for reconnection.

2. Disconnect wires from fan (2).

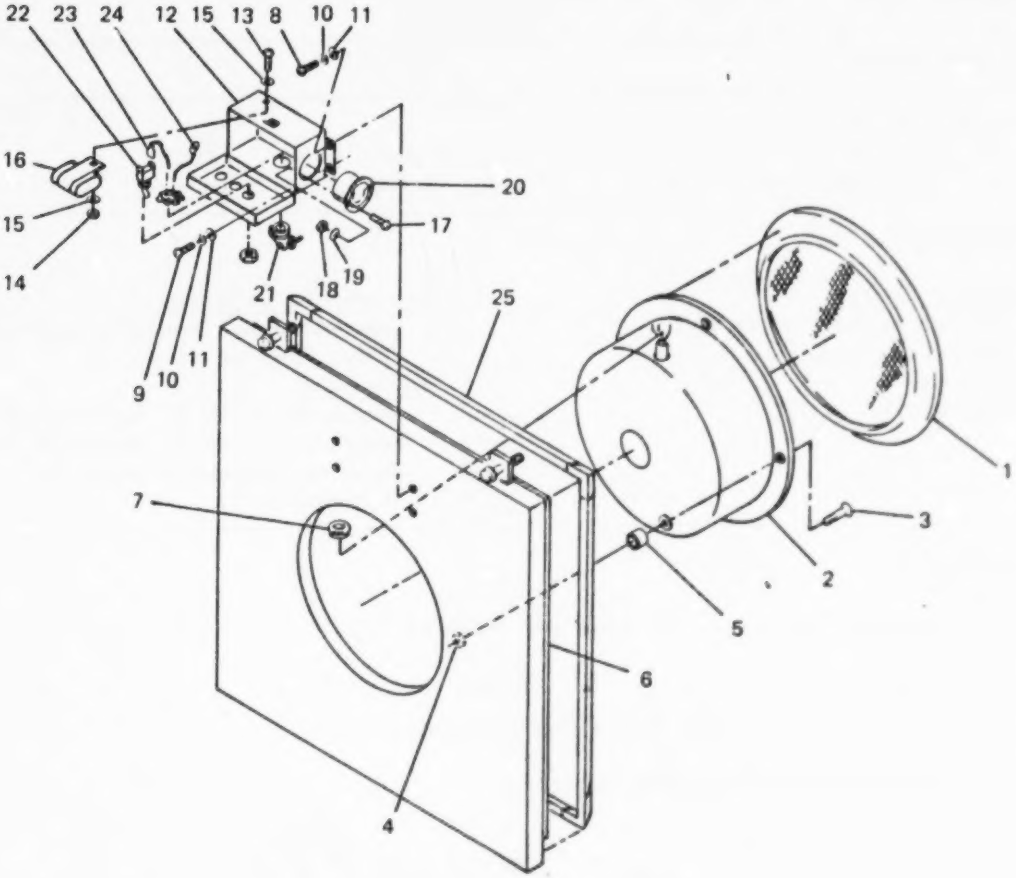


5-2. (cont)

3. Remove screws (3), blind nut (4), and standoffs (5), and separate fan (2) from closeout panel (6).

4. Pull wires through knockout bushing (7) in fan housing (2) and remove bushing (7).

5. Remove screws (8 and 9), lockwashers (10), and washers (11), and separate switch box (12) from closeout panel (6).


22
23
24
12
15
13
8
10
11
16
15
14
20
17
21
18
19
9
10
11
25
1
7
3
2
5
6
4

NOTE

Tag wires for reconnection.

6. Open door of switch box (12) and disconnect wires.

7. Remove screw (13), nut (14), washers (15), and strap and capacitor (16) from switch box (12).

5-2. (cont)

8. Remove screws (17), nuts (18), washers (19), and electrical connector (20) from switch box (12).

9. Pull wires through insulated connector (21) and out of switch box (12).

10. Remove insulated connector (21), toggle switches (22), disconnect terminals (23), and terminal lugs (24) from switch box (12).

11. Remove weather seal (25) from closeout panel (6).

CLEANING, INSPECTION

1. Wipe fan and panel assembly and components.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components.

   b. Corrosion or paint damage.

REPAIR

Corrosion or paint damage. (Refer to 4-37.)

INSTALLATION

1. Assemble weather seal (25) to closeout panel (6) and bond in place with adhesive.

2. Assemble insulated connector (21), toggle switches (22), disconnect terminals (23), and terminal lugs (24) in switch box (12).

3. Assemble electrical connector (20) in switch box (12) with screws (17), nuts (18), and washers (19).

4. Assemble strap and capacitor (16) in switch box (12) with screw (13), nut (14), and washers (15).

5. Pull wires through insulated connector (21) and connect in switch box (12). (Refer to 4-40.)

6. Close door of switch box (12) and assemble to closeout panel with screws (8 and 9), lockwashers (10), and washers (11).

7. Install knockout bushing (7) in fan housing (2).

5-2. (cont)

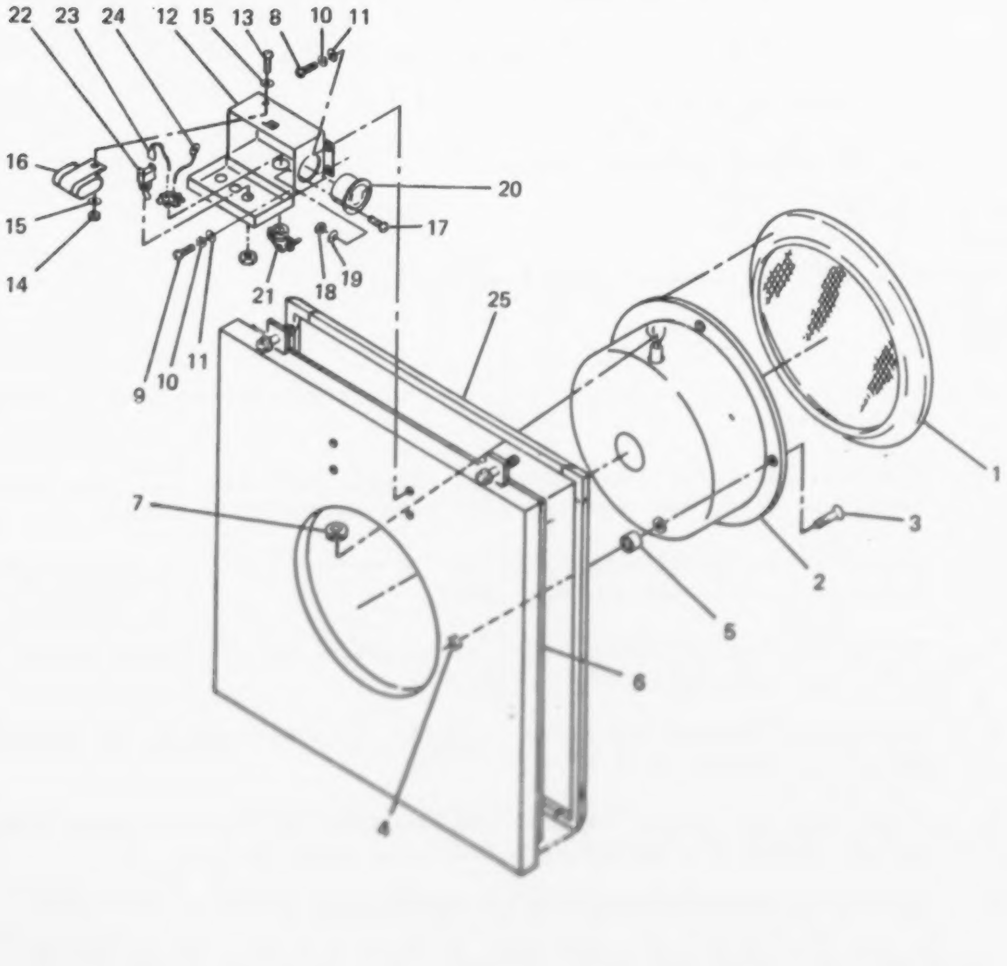
8. Before installing fan (2) on closeout panel (6), seal around the cutout in panel with adhesive and seal around fan with sealing compound.

9. Install fan (2) in closeout panel (6) with screws (3), blind nut (4), and standoffs (5).

10. Pull wires from switch box (12) through knockout bushing (7) in fan housing (2) and connect to fan. (Refer to 4-40.)

11. Assemble fan cover (1) to fan housing (2).

12. Seal around closeout panel edges with sealing compound.


22
23
24
12
15
13
8
10
11
16
20
15
17
14
21
18
19
25
9
10
11
1
7
3
2
5
6
4

5-3. ROOF PANEL

This task covers:
a. Removal
b. Installation

INITIAL SETUP

Special Tools
Top lifting container lift sling, Appendix D

Standard Tools
General mechanics tool kit
Electrical tool kit

Personnel - 6
1 Electrician

Materials
Sealing compound, Item 19, Appendix E
Solvent, Item 20, Appendix E

REMOVAL

1. Disconnect site power.
2. Set main circuit breaker and circuit breaker CB6 to off position.
3. Remove roof area ceiling lights. (Refer to 4-11.)
4. Remove bolts (1), lockwashers (2), and washers (3) securing fixed roof to upper ISO fittings (4).
5. Remove bolts (5), lockwashers (6), and washers (7) securing fixed roof to front endwall and sidewall.
6. Remove bolts (10), lockwashers (11), and washers (12) securing roof to rear endwall and remove drip cap (9).

WARNING

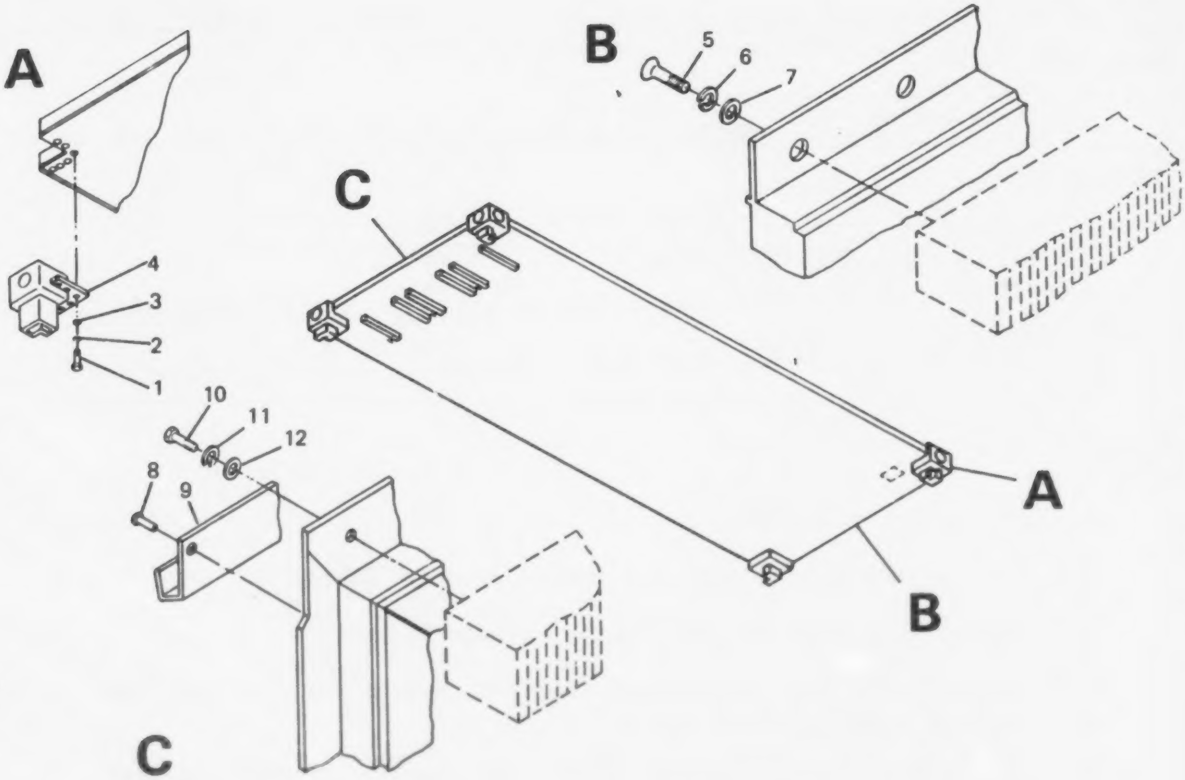
Methylethylketone is flammable and toxic and shall be used in a well-ventilated area away from sparks or open flame. Gloves should be worn during use.

7. Apply solvent to sealed interface areas between roof, sidewall, and endwalls.

CAUTION

Do not damage roof panel.

5-3. (cont)



8. Push roof up from endwalls to gain clearance for sling.

9. Slide web straps of lifting sling under roof and attach to crane or equivalent lifting device.

10. Remove roof.

CLEANING, INSPECTION

1. Clean mating surfaces.

2. Inspect mating surfaces for corrosion and damage.

INSTALLATION

1. Apply sealing compound to mating areas of roof with endwalls and sidewalls.

2. Position roof over shelter with crane (or equivalent lifting device) and a lifting sling with web straps.

3. Support roof and remove sling straps to allow roof to be supported by upper ISO fittings at corner posts.

5-3. (cont)

4. Align mounting holes at ISO fittings.

5. Install bolts (1), lockwashers (2), and washers (3) securing fixed roof to upper ISO fittings (4).

6. Install bolts (10), lockwashers (11), and washers (12) securing roof to front endwall.

7. Install bolts (5), lockwashers (6), and washers (7) securing drip cap (9) and roof to rear endwall.

8. Install bolts (5), lockwashers (6), and washers (7) securing roof to sidewalls.

9. Install ceiling lights. (Refer to 4-11.)

10. Connect site power.

11. Set main and circuit breakers CB6 to ON position.

5-4. CORNER POST AND ISO FITTING ASSEMBLY

This task covers:

a. Removal	d. Repair
b. Disassembly	e. Assembly
c. Cleaning, Inspection	f. Installation

INITIAL SETUP

Special tools Hand blind riveter, Appendix B, Item 2	Standard tools General mechanics tool kit Personnel - 2

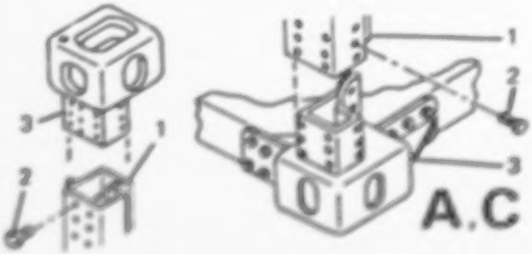
REMOVAL

NOTE

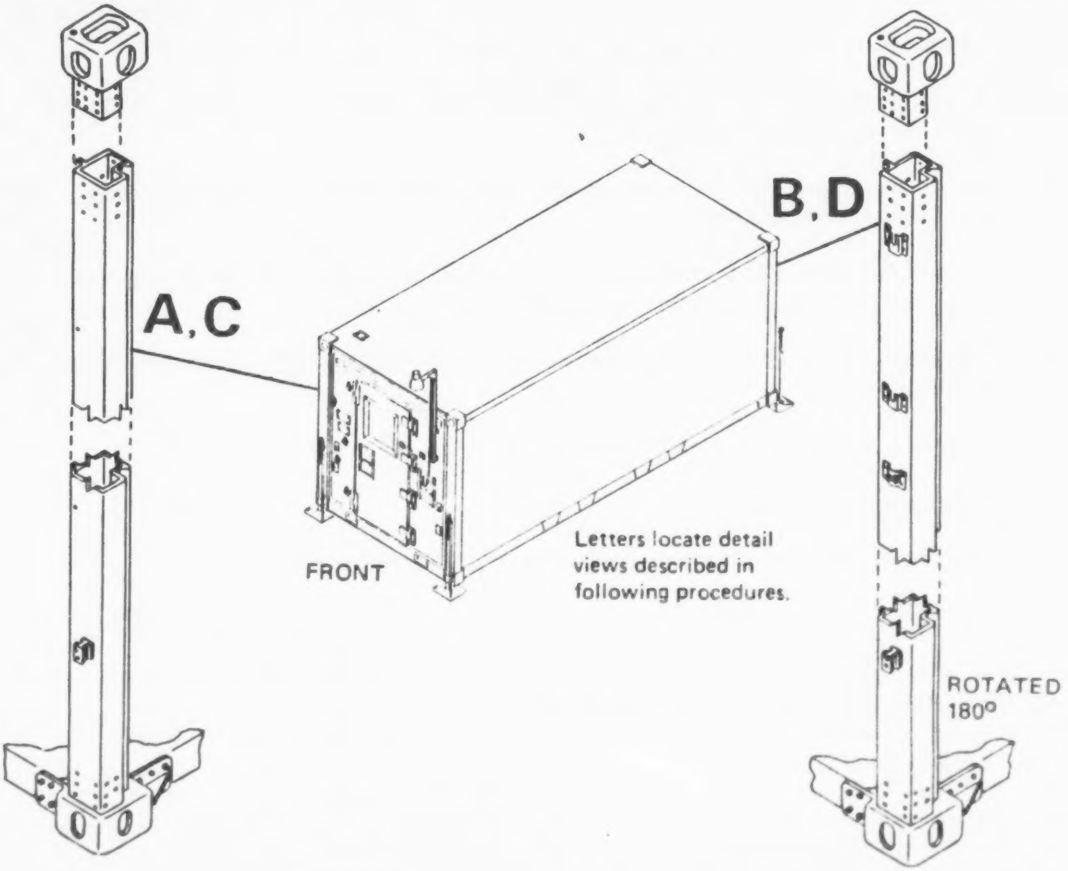
Remove shelter components as required for individual corner post replacement.

1. Remove front endwall panel in accordance with paragraph 4-19.

2. Remove rear endwall panel in accordance with paragraph 4-20.



5-4. (cont)



Letters locate detail views described in following procedures.

CAUTION

Support free corner of affected side-wall with web straps around girth of shelter.

3. Remove roof panel in accordance with paragraph 5-3.

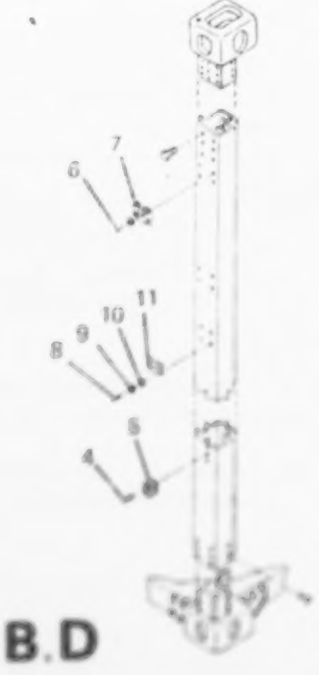
4. Support corner post (1) and remove bolts (2) securing post to upper and lower ISO fittings (3).

DISASSEMBLY

1. Remove screws (4) and remove jack support fitting (5).

2. Drill out rivets (6) and remove light bracket (7). (Refer to 4-26.)

3. Remove screws (8), lockwashers (9), and washers (10) and remove door holder (11).



5-4. (cont)

CLEANING, INSPECTION

1. Wipe post and component surfaces.
2. Inspect mounting surfaces for corrosion and damage.
3. Inspect for and replace if necessary.
   a. Missing or damaged components
   b. Corrosion or paint damage.

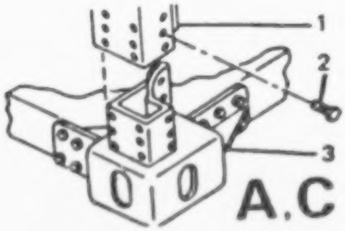
REPAIR

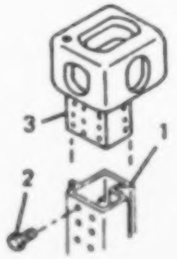
Corrosion or paint damage. (Refer to 4-37.)

ASSEMBLY

1. Position door holder (11) and install washers (10), lockwashers (9) and screws (8).
2. Position light bracket (7) and install rivets (6). (Refer to 4-26.)
3. Position jack support fitting (5) and install screws (4).

INSTALLATION





1. Position and support corner post (1) on upper and lower ISO fitting (3) and install bolts (2).
2. Install roof panel in accordance with paragraph 5-3.
3. Install rear endwall panel in accordance with paragraph 4-20.
4. Install front endwall panel in accordance with paragraph 4-19.

CHAPTER 6

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

6-1. GENERAL. This chapter consists of maintenance procedures for general support personnel. These procedures are limited to the floor panel replacement (paragraph 6-2).

6-2. FLOOR PANEL/BASE FRAME

This task covers:

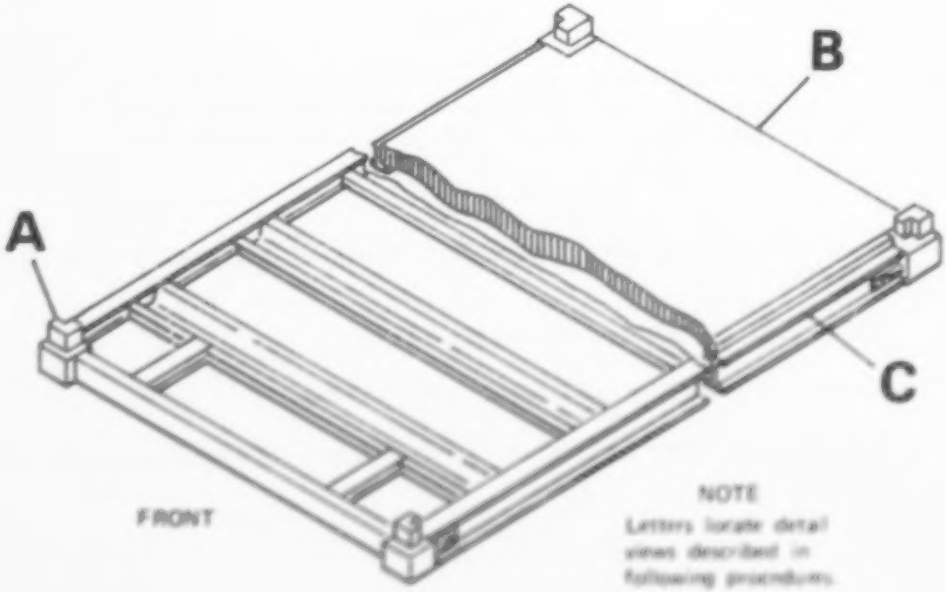
- a. Removal
- b. Disassembly
- c. Cleaning, Inspection
- d. Assembly
- e. Installation

INITIAL SETUP

Special tools
  Hand blind riveter, Appendix B, Item 2
  Blind bolt removal tool kit, Appendix B, Item 11
  Installation tool, Appendix B, Item 13
  Bottom lifting container lift sling, Appendix D
Standard Tools
  General mechanics tool kit

Personnel - 4
Materials
  Adhesive, Item 3, Appendix E
  Sealing compound, Item 19, Appendix E
  Solvent, item 20, Appendix E

REMOVAL

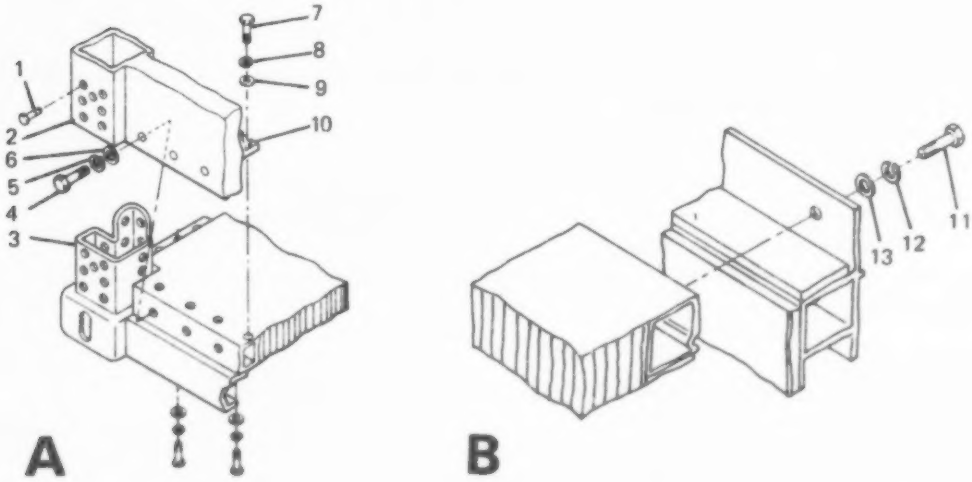


NOTE
Letters locate detail views described in following procedures.

6-2. (cont)

1. Remove bolts (1) securing corner posts (2) to lower ISO fittings (3).

2. Remove bolts (4), lockwashers (5), and washers (6) securing front endwall to floor.



3. Remove screws (7), lockwashers (8), and washers (9) securing reinforcement angles (10) to floor.

4. Remove bolts (11), lockwashers (12), and washers (13) securing rear endwall to floor.

WARNING

Methylethylketone is flammable and toxic and shall be used in a well-ventilated area away from sparks or open flame. Gloves should be worn during use.

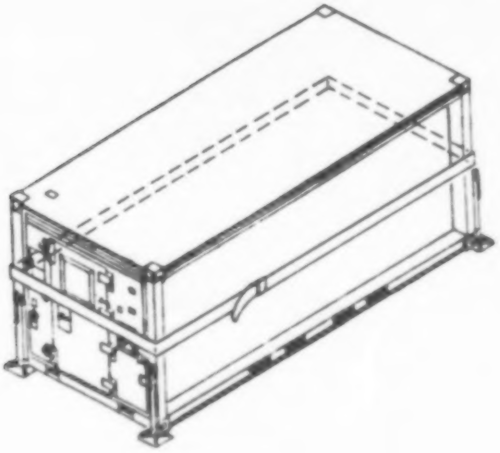
5. Apply solvent to sealed interface areas of floor with sidewalls and endwalls.

6. Secure web straps around shelter body.

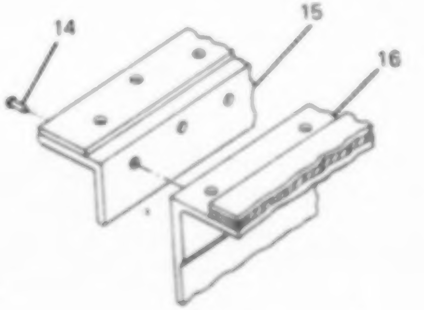
7. Attach lifting sling to upper ISO fittings.

8. Lift shelter body away from floor and set in level position on blocks.

6-2. (cont)

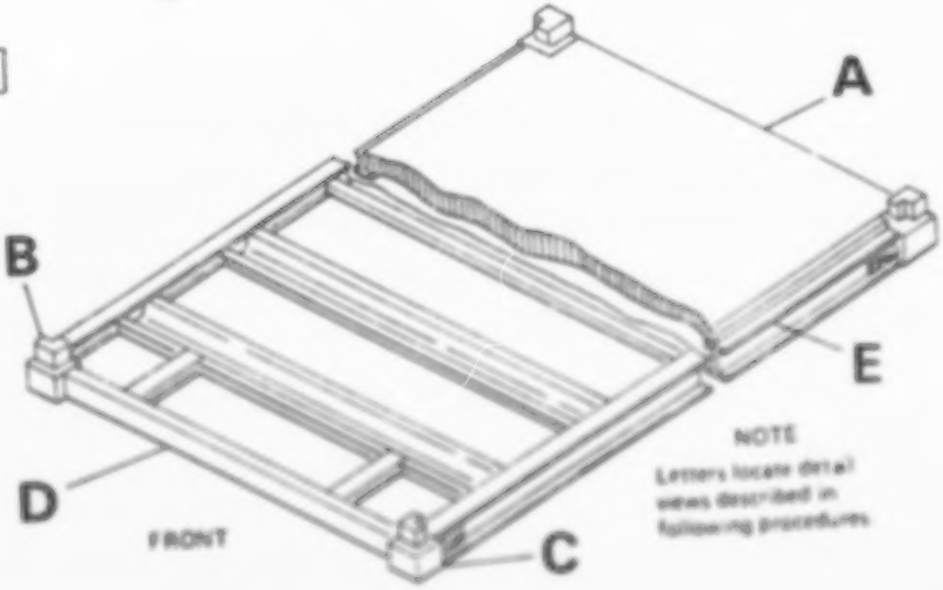


9. Using blind bolt removal tool kit, remove rivets (14) and support angle assembly (15). (Refer to 4-26.)



C

DISASSEMBLY



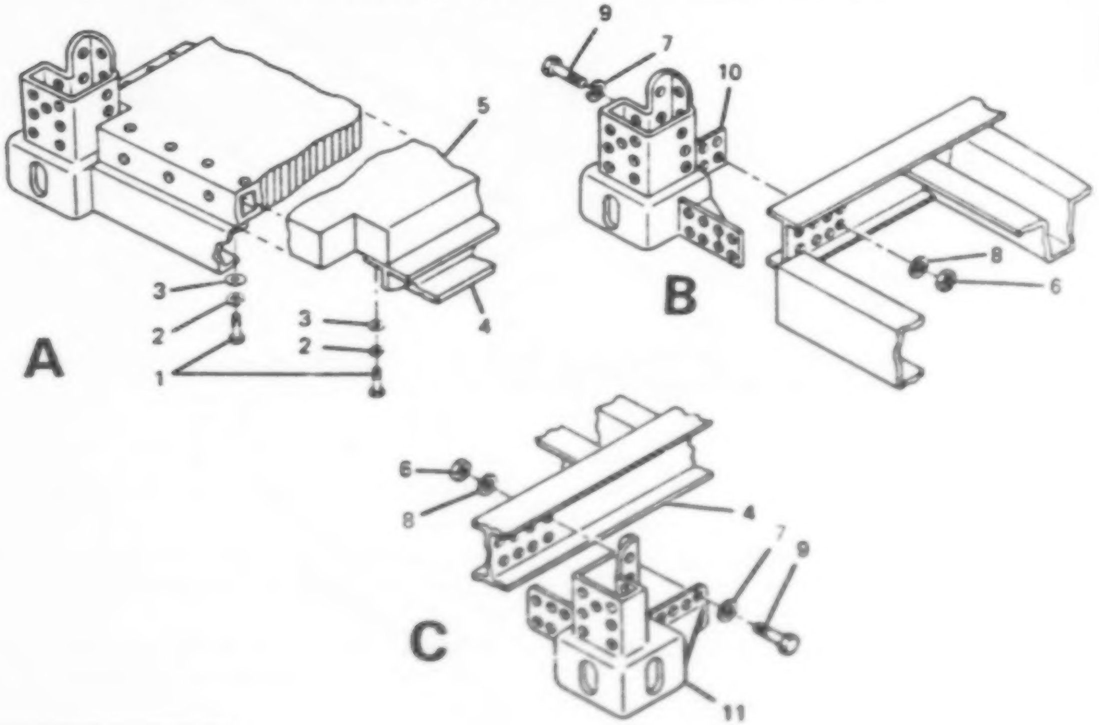
NOTE

Letters locate detail views described in following procedures.

6-2. (cont)

1. Remove screws (1), lockwashers (2), and washers (3) securing base frame (4) to floor panel (5).

2. Remove nuts (6), lockwashers (7), washers (8), and bolts (9) securing lower ISO fittings (10 and 11) to base frame (4).



CLEANING, INSPECTION

1. Wipe panel and component surfaces.

2. Inspect mounting surfaces for corrosion and damage.

3. Inspect for and replace if necessary:

   a. Missing or damaged components

   b. Corrosion or paint damage.

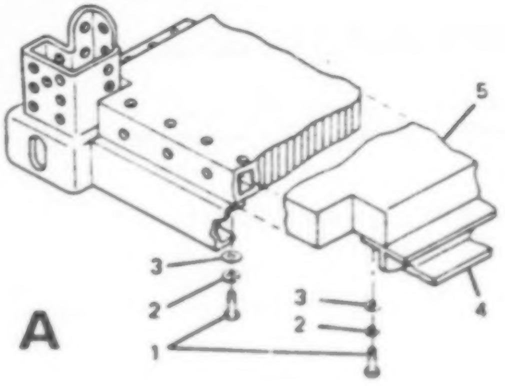
REPAIR

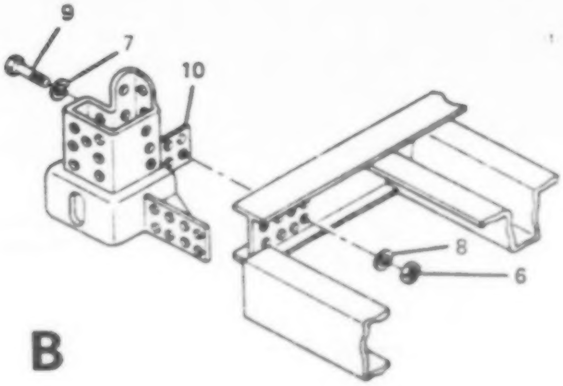
1. Panel skin damage. (Refer to paragraphs 4-25 through 4-36.)

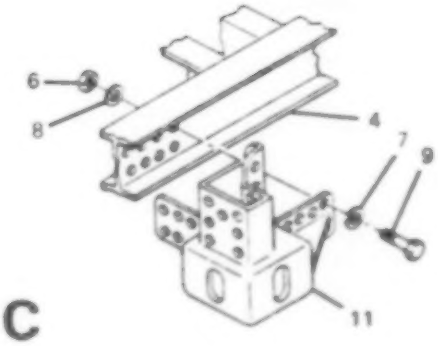
2. Corrosion or paint damage. (Refer to 4-37.)

6-2. (cont)

ASSEMBLY







1. Position lower ISO fittings (10 and 11) on base frame (4) and install bolts (9), washers (8), lockwashers (7), and nuts (6).

2. Position base frame (4) on floor panel (5) and install washers (3), lockwashers (2), and screws (1).

INSTALLATION

NOTE

Turn floor over with base frame down.

1. Using installation tool, assemble support angle assembly (15) to base frame (16) with rivets (14). (Refer to 4-26.)

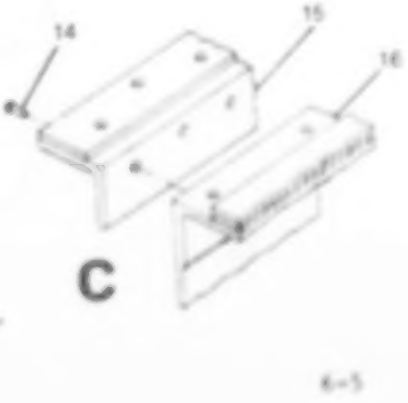
2. Secure web straps around shelter body.

3. Attach lifting sling to upper ISO fitting.

4. Lift shelter body and lower to position above floor.

5. Apply sealing compound to interface areas of floor and endwalls.

6. Lower shelter body carefully to fixed floor.



6-2. (cont)

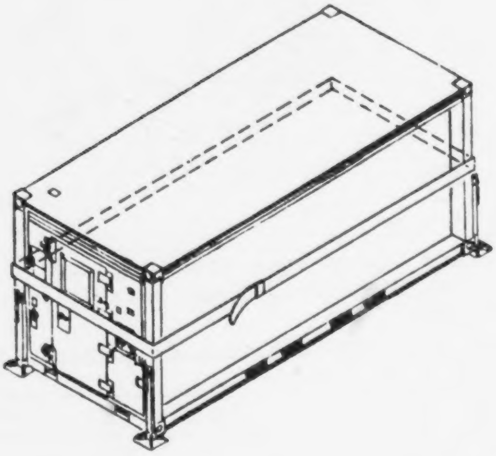
7. Ensure that corner posts engage lower ISO fittings at all four corners.

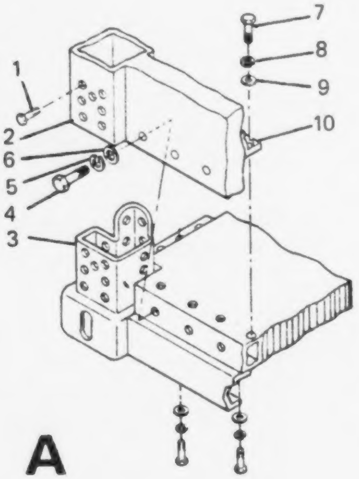
8. Secure rear endwall to floor with washers (13), lockwashers (12), and bolts (11).

9. Secure front endwall to floor with washers (6), lockwashers (5), and bolts (4).

10. Secure reinforcement angles (10) to floor with washers (9), lockwashers (8) and screws (7).

11. Secure corner posts (2) to lower ISO fittings (3) with bolt (1).





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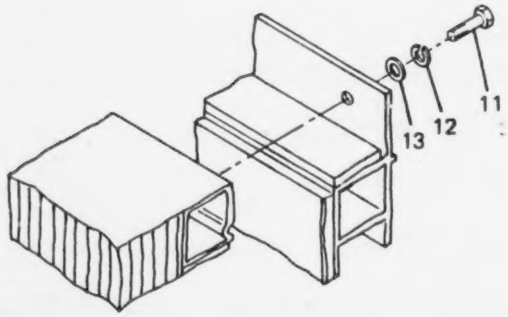


B

APPENDIX A

REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals, technical manuals and miscellaneous publications referenced in this manual.

A-2. FORMS

Recommended Changes to Publications and Blank Forms	DA-2028
Quality Deficiency Report	SF-368
Packaging Improvement Report	DD-Form-6

A-3. FIELD MANUALS

Destruction Of Equipment To Prevent Enemy Use	TM 750-244-3

A-4. TECHNICAL MANUALS

Repair Parts And Special Tools List	TM 10-5411-202-24P
The Army Maintenance Management System	DA Pamphlet 738-750
Dollyset Model No. M832	TM 9-2330-275-14&P
Dollyset Model No. M1C22	TM 9-2330-379-14&P

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. SCOPE

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component and the work measurement time required to perform the functions by the designated maintenance level. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the tools and test equipment required for each maintenance function as referenced from Section II.

B-2. EXPLANATION OF COLUMNS IN SECTION II

a. Column 1, Group Number. Column 1 lists group numbers to identify related components, assemblies, subassemblies, and modules with their next higher assembly. The applicable groups are listed in the MAC in disassembly sequence beginning with the first group removed.

b. Column 2, Component/Assembly. This column contains the noun names of components, assemblies, subassemblies and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. This column lists the functions to be performed on the item listed in Column 2. The maintenance functions are defined as follows:

(1) Inspect. To determine serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

(2) Test. To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

(3) Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

(4) Adjust. To maintain within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

(5) Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

(6) Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

(7) Install. The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

(8) Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

(9) Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, or replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

(10) Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to a like new condition.

(11) Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipments/components.

d. Column 4, Maintenance Category. This column is made up of subcolumns for each category of maintenance. Work time figures are listed in these subcolumns for the lowest level of maintenance authorized to perform the function listed in Column 3. These figures indicate the average active time required to perform the maintenance function at the indicated category of maintenance under typical field operating conditions.

e. Column 5, Tools and Equipment. This column is provided for referencing by code, the common tool sets (not individual tools), special tools, test and support equipment required to perform the designated function.

B-3. EXPLANATION OF COLUMNS IN SECTION III

a. Column 1, Reference Code. This column consists of an arabic number listed in sequence from Column 5 of Section II. The number references the common tool sets, special tools and test equipment requirements.

b. Column 2, Maintenance Category. This column shows the lowest category of maintenance authorized to use the special tools or test equipment.

C = OPERATOR/CREW
O = ORGANIZATIONAL
F = DIRECT SUPPORT
H = GENERAL SUPPORT
D = DEPOT

c. Column 3, Nomenclature. This column lists the name or identification of the common tool sets, special tools or test equipment.

d. Column 4, National/Nato Stock No. (NSN). This column is provided for the NSN of common tool sets, special tools and test equipment listed in the nomenclature column.

e. Column 5, Tool Number. This column lists the manufacturer's code and part number of tools and test equipment.

Section II. MAINTENANCE ALLOCATION CHART
for
SHELTER, TACTICAL, NONEXPANDABLE

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level C	O	F	H	D	(5) Tools and Equipment	(6) Remarks
01	ELECTRICAL SYSTEM								
	Circuit Breaker Panel Assembly	Inspect	0.2						
		Test		0.2				4	
		Replace		1.0				1	
		Repair		0.5				1	
	Panel Wiring	Inspect	0.2						
		Test		0.2				4	
		Replace		0.5				1	
		Repair		0.5				1	
	Light Switches	Inspect	0.2						
		Test		0.2				4	
		Replace		0.3				1	
	Circuit Breakers	Inspect	0.2						
		Test		0.1				4	
		Replace		0.2				1	
	Power Entry Panel Assembly	Inspect	0.2						
		Test		0.2				4	
		Replace		1.0				1,2	
		Repair		0.5				1,2,12	
	Receptacles	Inspect	0.1						
		Test		0.2				4	
		Replace		0.3				1,12	
		Repair		0.3				1	
	Terminals/ Connectors	Inspect	0.2						
		Replace		0.3				1	
		Repair		0.3				1	
	Area Light Assembly	Inspect	0.1						
		Test		0.1				4	
		Replace	0.1					1	
		Repair		0.5				1,2	
	Incandescent Light Assembly	Inspect	0.1						
		Test		0.1				4	
		Replace		0.5				1	
		Repair		0.3				1	

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
	Ceiling Lights	Inspect	0.1						
		Test		0.1				4	
		Replace		0.2				1	
		Repair		0.5				1,2	
	Receptacle Outlets	Inspect	0.1						
		Test		0.1				4	
		Replace		0.3				9	
		Repair		0.2				1	
	Switch, Wall	Inspect	0.1						
		Replace		0.3				1	
	Switch, Blackout, Door Activated	Inspect	0.1						
		Replace		1.5				1	
		Repair		0.5				1	
		Adjust		0.2				1	
	Fan Assembly	Inspect	0.1						
		Test		0.2				1,4	
		Service	0.2					1	
		Replace		0.1				1	
		Repair			1.0			1,4	
	Wiring	Inspect		0.3					
		Test		0.3				4	
		Replace		4.0				1	
		Repair		2.0				1	
02	DOOR ASSEMBLIES								
	Door, Personnel	Inspect	0.1						
		Replace		0.5				1,2	
		Repair		2.0				1	
		Align		0.2				1	
	Door Vent	Inspect	0.1						
		Replace		1.0				1	
		Repair		0.5				1,2	
		Align		0.2				1,2	
	Door Lock Assembly	Inspect	0.1						
		Replace		0.2				1,2	
		Repair		0.2				1	
	Door Stop Assembly	Inspect	0.1						
		Replace		0.2				1	
		Repair		0.2				1,2	

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
03	CONTAINER LIFT JACK ASSEMBLIES	Inspect	0.2						
		Service		0.1				5	
		Replace	0.2					1	
		Repair		0.5				1	
04	FIXED PANEL ASSEMBLIES								
	Endwall panel, front	Inspect	0.2						
		Replace		4.0				1	
		Repair		2.0				1,2	
	Level Assembly	Inspect	0.1						
		Replace		0.5				2	
		Repair		0.4				1	
	Step, folding	Inspect	0.1						
		Replace		0.2				1	
		Repair		0.2				1	
	Endwall panel, Rear	Inspect	0.2						
		Replace		3.0				1	
		Repair		2.0				1,2	
	ECU intake panel	Inspect	0.1						
		Replace	0.1					1	
		Repair		0.5				1,2,3	
	ECU return panel	Inspect	0.1						
		Replace	0.1					1	
		Repair		0.5				1,3	
	Closeout panel	Inspect	0.1						
		Replace	0.1					1	
		Repair		0.5					
	Sidewall panel	Inspect	0.3						
		Replace		4.0					
		Repair		3.0					
	Roof Panel	Inspect	0.3						
		Replace			6.0			1,6,7	
		Repair		3.0				1,2	
	Stowage brackets	Inspect	0.1						
		Replace		0.2				1	
		Repair		0.2				1	
	Floor panel/Base Frame	Inspect	0.2						
		Replace				12.0		1,2,7,8	
		Repair		3.0				1,13,14	

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
05	FRAME ASSEMBLY								
	Corner post and ISO fitting assembly	Inspect	0.2						
		Replace			10.0			1,2	
		Repair			2.0			1,2	
06	MISCELLANEOUS COMPONENTS								
	Equipment container	Inspect	0.2						
		Replace		0.2				1	
		Repair		0.5					
	Storm configuration components	Inspect	0.1						
		Replace	0.2					1	

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

SHELTER, TACTICAL, NONEXPANDABLE

(1) REFERENCE CODE	(2) MAINTENANCE CATEGORY	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER (NSN)	(5) TOOL NUMBER
1	C, O, F, H	Tool Kit, General Mechanics	5180-00-177-7033	
2	O, F, H	Riveter, Blind, Hand	5120-00-017-2849	
3	C	Installation tool		FSCM 08524 FRB703-12
4	O	Multimeter	6625-00-999-6282	
5	O	Tool Kit, Electrical	5180-00-876-9336	
6	O	Drill, Electric, Portable 1/4 inch cap	5130-00-204-2778	
7	O	Fastener Header (10-32, 1/4-28)		FSCM 03481 C845
8	O	Fastener Header (5/16-24, 3/8-24)		FSCM 03481 C-722
9	O	Wrench, Box End or Adjustable		
10	O	Crimping Tool		FSCM 56501 TBM5
11	O	Tool Kit, Blind Bolt Removal		FSCM 17446 105-60
12	O	Tool Kit, Blind Bolt Removal		FSCM 17446 105-80
13	O	Installation Tool		FSCM 17446 115
14	O	Router, Electric, Portable	5130-00-990-4449	
15	O	Heat Lamp, Tripod Base		FSCM 39428 3439K11

APPENDIX C

COMPONENTS OF THE END ITEM LIST

Section I. INTRODUCTION

C-1. SCOPE

This appendix lists components of end item for the shelter to help you inventory items required for safe and efficient operation.

C-2. GENERAL

The Components of End Item List is provided in Section II. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

C-3. EXPLANATION OF COLUMNS IN SECTION II

The following provides an explanation of columns found in the tabular listings:

a. Column (1) - Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

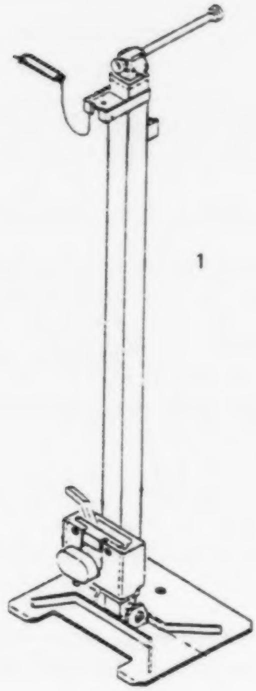
b. Column (2) - National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

c. Column (3) - Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

d. Column (4) - Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

e. Column (5) - Quantity required (Qty rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

Section II. COMPONENTS OF END ITEM



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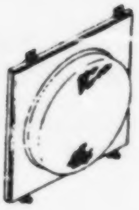

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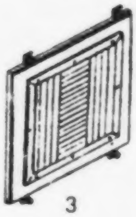

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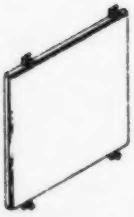

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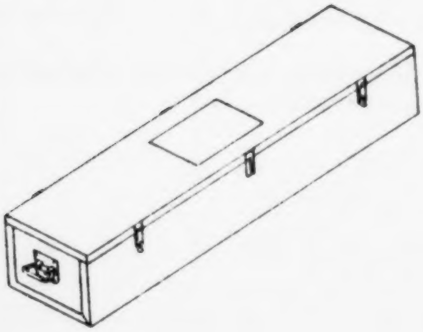

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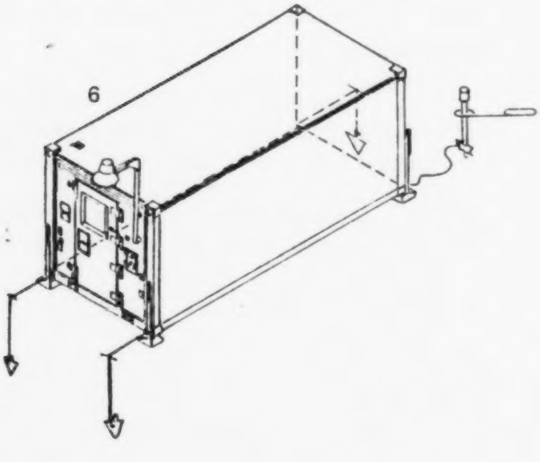
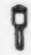


Section II. COMPONENTS OF END ITEM (cont)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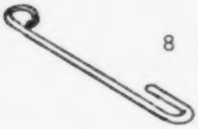
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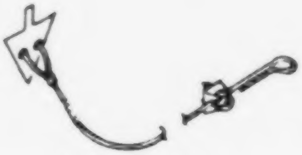
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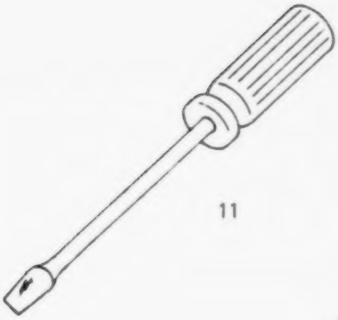
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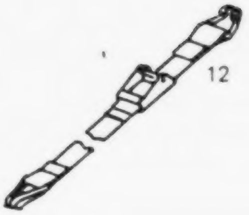
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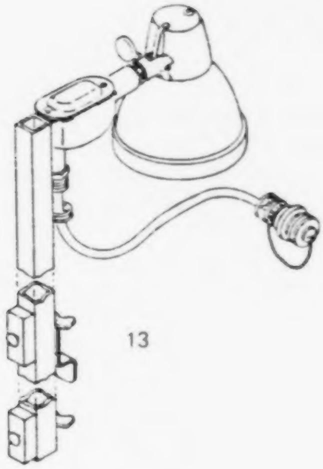
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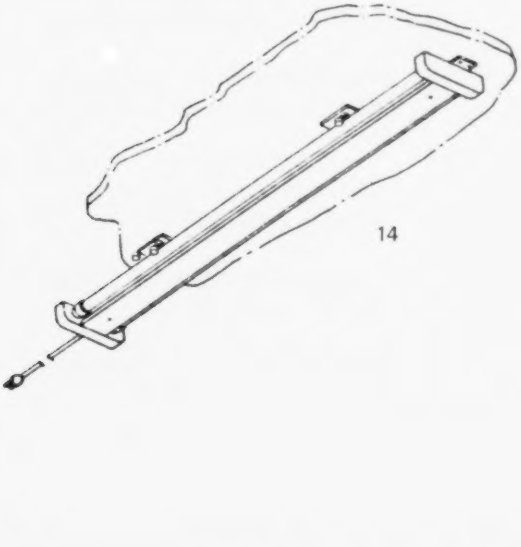
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Section II. COMPONENTS OF END ITEM (cont)

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty rqr
1		JACK ASSEMBLY, INTERNATIONAL STANDARD FITTING (81377) 5-4-2866-1	EA	4
2		PANEL ASSEMBLY, ECU RETURN (81377) 5-4-2857-1	EA	1
3		PANEL ASSEMBLY, ECU INTAKE (81377) 5-4-2856-1	EA	1
4		CLOSEOUT PANEL ASSEMBLY 21 x 21 (81377) 5-4-2853-1	EA	3
5		EQUIPMENT CONTAINER WITH CONTENTS (81377) 5-4-5096-1	EA	1
6		TIEDOWN INSTALLATION (81337) 5-4-4713-1	EA	1
7		DRIVE HEAD (81349) MIL-A-3962 size 4 inch	EA	1
8		HOLDING HANDLE (81349) MIL-A-3962 size 4,6, or 8 inch	EA	1
9		DRIVE ROD (81349) MIL-A-3962 size 4 inch	EA	1
10		GROUND ANCHOR ASSEMBLY (81337) 5-4-2981-1	EA	4
11		SCREWDRIVER (81349) GGG-S-121 class 5 design A	EA	1
12		STRAP ASSEMBLY, TIEDOWN (81337) 5-4-4944-1	EA	2
13		LIGHT ASSEMBLY, EXTERIOR (81337) 5-4-2974-1	EA	1
14		LIGHT ASSEMBLY, REMOVABLE (81337) 5-4-2954-1	EA	3

APPENDIX D

ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

D-1. SCOPE

This appendix lists additional items you are authorized for the support of the shelter.

D-2. GENERAL

This list identifies items that do not have to accompany the shelter and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

D-3. EXPLANATION OF LISTING

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you.

Section II. ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM & PART NUMBER	(3) U/M	(4) QTY AUTH
	CONTAINER LIFT SLING, bottom lifting (65059) 74016B-20	EA	1
	CONTAINER LIFT SLING, top lifting (65059) 74016T-1A	EA	1
5120-01-013-1676	GROUND ROD ASSEMBLY	EA	1
5120-00-293-0887	SLEDGE HAMMER, 12 pound	EA	1
5979-00-878-3791	SLIDE HAMMER, ground	EA	1

APPENDIX E

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. SCOPE

Section II of this appendix lists expendable supplies and materials you will need to operate and maintain the shelter. These items are authorized to you by CTA 50-970, Expendable Items. Adjust when higher category maintenance requirements are involved.

E-2. EXPLANATION OF COLUMNS IN SECTION II

a. Column 1, Item Number. This number is assigned to the entry and is referenced in the narrative instructions to identify the material.

b. Column 2, Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew
O - Organizational Maintenance
F - Direct Support Maintenance
H - General Support Maintenance

c. Column 3, National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4, Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parenthesis followed by the part number.

e. Column 5, Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	O	8040-01-035-7848	Adhesive (FE6026)	kt
2	O		Adhesive, Silicon	
3	O		Adhesive, Silicon	
4	O	*	Aluminum patch 0.040 in. thick x 12 x 12 in. (1.02 mm x 30.48 x 30.48 cm)	
5	O		Cloth, Cotton	
6	O		Coating system, epoxy-polymide (MIL-C-22751)	
7	O	*	Core, 3 in. thick x 12 x 12 ±1 (76.2 mm x 30.48 x 30.48 ±2.54 cm)	
8	O	*	Core, 2 1/2 in. thick x 12 x 12 ±1 (63.5 mm x 30.48 x 30.48 ±2.54 cm)	
9	O	*	Core, 2 in. thick x 12 x 12 ±1 (50.8 mm x 30.48 x 30.48 ±2.54 cm)	
10	O	*	Core, 1 1/2 in. thick x 12 x 12 ±1 (38.1 mm x 30.48 x 30.48 ±2.54 cm)	
11	O	8415-00-634-5027	Gloves, White	pr
12	O	9150-00-985-7246	Grease, Automotive (MIL-G-10924)	cn
13	O	5320-00-005-1051	Rivet, Blind 3/16 dia. 3/16 - 7/16 grip (1601-0619 Avdell Corp.)	ea
14	O	5320-00-426-4916	Rivet, Blind 3/16 dia. 1/16 - 1/4 grip (1601-0613 Avdell Corp.)	ea
15	O	5320-01-032-1043	Rivet, Blind 1/8 dia. 1/8 - 5/16 grip (1601-0414 Avdell Corp.)	ea
16	O	5320-00-825-0248	Rivet, Blind 1/8 dia. 1/32 - 3/16 grip (1601-0410 Avdell Corp.)	ea
17	O		Sandpaper	
18	O	8030-00-081-2333	Sealant (MIL-S-22473)	bt
19	O	8030-00-723-5343	Sealing compound (PR1422) (MIL-S-8802)	ct
20	O		Solvent, Methylethylketone	
21	O		Stick, Mixing	
22	O	7510-00-266-6712	Tape, Masking 1 in. wide (2.54 cm) (3M)	rl
23	O		Grease. Silicone (Dow Corning 111 compound)	
24	O		Aluminum Plate 1/8 in. thick X 2 in. square (3.2 mm x 50.8 mm)	
25	O	9150-00-823-7860	Lubricant, Spray	cn
26	O		Contact Cleaner (MIL-C-83300)	
27	O	7510-00-074-5124	Tape, Pressure-sensitive Adhesive High Strength 2 in. wide	rl

*Components of Shelter Repair Kit, Part Number 5-4-4224 FCSM 81337

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By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

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PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
6	2-1 a			In line 6 of paragraph 2-1a the manual states the engine has 6 Cylinders. The engine on my set only has 4 Cylinders. Change the manual to show 4 Cylinders.
81		4-3		Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is called a shim - Please correct one or the other.
125	line		20	I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered, so the NSN is wrong. Please give me a good NSN

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C